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Presentations at

# CALS CONFERENCE

COMPUTER-AIDED ACQUISITION  
AND LOGISTIC SUPPORT  
CALS Phase I.1 Core Requirements

AD-A198 630

A DoD/Industry/NBS Conference  
Held at  
The Marriott Hotel  
Gaithersburg, Maryland  
26 April 1988

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**Presentations at**

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# **CALS CONFERENCE**

**COMPUTER-AIDED ACQUISITION  
AND LOGISTIC SUPPORT  
CALS Phase I.1 Core Requirements**

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**A DoD/Industry/NBS Conference  
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The Marriott Hotel  
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26 April 1988**

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*Little's file*



*AM*





# C A L S   P H A S E   I.1   C O R E   R E Q U I R E M E N T S

Joint DOD/Industry/NBS Conference

26 April 1988

## A G E N D A

8:45	Greeting	Mr. David Bettwy, Deputy Chief Automated Production Tech. Division National Bureau of Standards
8:50	Opening Remarks - DOD	Mr. Russell Shorey, Chairman DOD CALS Steering Group
9:00	CALS Program: Progress and Plans	Dr. Michael McGrath, Director CALS Office, OASD(P&L)
9:50	Introduction to: MIL-R-RASTER	Mr. Charles Adams, President West Coast Information Systems
10:10	Introduction to: MIL-D-CGM	Mr. Dan Benigni, Computer Scientist Information Systems Eng. Division National Bureau of Standards
10:30	----- BREAK -----	
11:00	Core I.O. Requirement Documents Update: MIL-STD-1840A, MIL-D-28000, and 28001	Mr. David Bettwy & Mr. Brad Smith, Chairman IGES/PDES Standards Group
11:30	Introduction to: MIL-HDBK-CALS "CALS Implementation Guide"	Mr. Bruce Lepisto, Deputy Director CALS Office, OASD(P&L)
12:00	----- LUNCH -----	
13:00	CALS Industry Steering Group: Progress and Plans	Mr. H. Stormfeltz, Vice Chairman, CALS Industry Steering Committee Northrop Aircraft
13:30	PDES Inc.: The PDES Cooperative	W.B. (Brad) Rigdon, General Manager McDonnell Douglas Aerospace
14:00	CALS Test Network: An Update	Mr. Mel Lammers Air Force Logistics Command
14:30	----- BREAK -----	
15:00	Service Panel:  Chair - Dr. McGrath Plans and Strategies for the Evolution of CALS	Ms. Jean Lamb, Headquarters Army Materiel Command Col. Eugene Tattini, Director, Plans and Programs, DCS Product Assurance and Acquisition Logistics Mr. Gerard C. Hoffmann, Specifica- tion Control Advocate General of the Navy Ms. Karen Gregory, CALS Management Support, Defense Logistics Agency



## INTRODUCTION

The Joint DOD/Industry/NBS Conference on the Computer-aided Acquisition and Logistic Support (CALS) Phase I.1 Core Requirements was held at Gaithersburg, Maryland on 26 April 1988. The latest set of core requirements documents were introduced into the formal coordination process; in addition, presentations at the conference provided information about the status and plans of various government and industry CALS activities. The CALS draft core requirements documents introduced at the conference were:

MIL-R-RASTER	Raster Graphics Representation in Binary Format, Requirements for
MIL-D-CGM	Digital Representation for Communication of Illustration Data: CGM Application Profile
MIL-HDBK-CALS	Department of Defense Computer-aided Acquisition and Logistic Support (CALS) Program Implementation Guide
MIL-STD-1840A	Notice 1; Automated Interchange of Technical Information
MIL-D-28000	Ammendment 1; Digital Representation for Communication of Product Data: IGES Application Subsets

A sixth draft document, TRIF 2.0, "Tiled Raster Graphics Content Architecture," was also distributed to the attendees to assist them in evaluating the draft MIL-R-RASTER which references TRIF 2.0.

The speakers at the conference described in some detail the changes and amendments to the CALS Phase I.0 documents, MIL-STD-1840A and MIL-D-28000, and the three Phase I.1 documents released for coordination. In addition to covering the status of the current DOD and Industry Task Force activities, presenters at the conference also introduced two new CALS programs, PDES Inc. and the DOD/Industry CALS Test Network. PDES Inc. is an industry cooperative recently formed to accelerate the implementation of the Product Data Exchange Standard (PDES) technology, a computer interpretable form of product data. The Cals Test Network is an Air Force managed project to test the CALS core requirements in a controlled environment, and to provide feedback to the standards process and vendor implementations. The final session of the conference was a panel discussion by the Services and the Defense Logistics Agency of their plans and strategies for the evolution of CALS.

This document provides a record of the conference agenda, biographical sketches of the conference speakers, and copies of the speakers' presentation materials.

# D O D   C A L S   P O I N T S   O F   C O N T A C T

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	POLICY	Bruce Lepisto	(202) 697-0051
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	&	Susan O'Neal	(202) 697-0051
	CALS	James Dalgety	(703) 756-8420
	SUPPORT	Donald Hall	(703) 756-8420
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	SPECS & STDS	James Dalgety	(703) 756-8420
	WORKING GRP	Ernest Thorne	(703) 756-2554
	COMMUNICATIONS	Jack Bartley	(202) 695-9505
	WORKING GRP		
	IMPLEMENTATION	Bruce Lepisto	(202) 697-0051
	WORKING GRP	Service/Agency POC's	
	PDES TASK GROUP	Gary Denman	(202) 697-9351
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NAVY	NAVSUP	William Gorham	(202) 694-9111
AIR FORCE	AFSC	LTC Dave Long	(301) 981-3915
DLA	DCALSO	William Presker	(703) 274-4210
NBS		Roy Morgan	(301) 975-3254
		David Bettwy	(301) 975-6642

## ----- D O D   C A L S   S T E E R I N G   G R O U P

	PRINCIPAL	ALTERNATES
CHAIRMAN	Russell R. Shorey	Michael F. McGrath
ARMY	Eric Orsini	Richard Heinbach Joseph Cribbins Philip Dickinson Jack Hobbs
NAVY	Gerald Hoffman	Emerson Cale Clifford Geiger
AIR FORCE	Lloyd Mosemann	MGEN Edward Bracken MGEN David Teal Oscar Goldfarb Richard Bruner
DLA	Thomas Knapp	
DCA	Herbert Goertzel	
DARPA	William Bandy	
SDIO	COL James Graham	
OSD	John Mittino	
	DASD(L)	
	DASD(S)IS	
	DASD(PS)SDM	
	OASD(C)IRM	
	OASD(C <sup>3</sup> I)IS	
	James Miller	
	Peter Yurcisin	
	John Springett	
	Diane Fountaine	
		Randy Jennings Michael Corrigan
NBS (Tech Advisor)	Helen Wood	David Jefferson

# INDUSTRY CALS TASK FORCE

CHAIRMAN:	MR. RICHARD WEBSTER	(302) 539-9078
VICE CHAIRMAN:	MR. HAROLD STORMFELTZ	(213) 416-3106
COMMITTEE EXECUTIVE:	MR. LON CALDWELL	(202) 393-3620
ADVISOR:	MS. RUTH DAVIS	(703) 243-3993

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Mr. John Roche, McDonnell Douglas Aircraft Company	(314) 232-5171
Ms. Naomi McAfee, Westinghouse Electric Company	(301) 765-3400
Mr. Joe Meredith, Newport News Shipbuilding	(703) 892-4470
Mr. Martin Plawsky, Grumman Aircraft Systems	(516) 753-1473

## DATA SECURITY TASK GROUP

Mr. Howard Chambers, Rockwell International	(213) 414-1841
Mr. Bill Jascomb, Lockheed Corporation	(404) 424-3529

## DIGITAL INFORMATION EXCHANGE TASK GROUP

Mr. Stanley Meyers, Grumman Data Systems	(516) 682-8552
Mr. Paul Pechersky, E-Systems	(214) 661-1000
Mr. Morris Schur, Eastman Kodak Corporation	(703) 558-3792

## ACQUISITION TASK GROUP

Mr. Herman Correale, McDonnell Aircraft Company	(314) 324-7040
---	----------------

## EDUCATION AND PUBLIC COMMUNICATIONS TASK GROUP

Mr. John Goclowski, Dynamic Research Corporation	(617) 475-9090
Mr. Richard Summers, Westinghouse Electric Company	(301) 765-1875

## INTERNATIONAL TASK GROUP

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Mr. Jonathan Tilton, General Electric Company	(617) 594-5492

## ASSOCIATION LIAISON

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CUE	Mr. James Reid	(316) 681-7892
EIA	Mr. Edward Nucci	(202) 457-4965
ICA	Mr. Al Frager	(703) 892-9480
NCGA	Mr. Robert Willis	(703) 698-9600
NSIA	Mr. Lon Caldwell	(202) 393-3620
SOLE	Mr. John Goclowski	(617) 475-9090

## CALS BULLETIN BOARD SYSTEM

301-948-7438 -- 301-921-9842

Available 24 hours a day, 7 days a week  
[Two lines --- 300/1200/2400 baud]

### How to use the CALS BBS:

1. You must have a standard ASCII terminal or computer. Modem settings are:
  - 300, 1200, or 2400 baud
  - 8 or 7 data bits
  - even or no parity
  - 1 stop bit
2. Dial 301-948-7438 or 301-921-9842. Metropolitan Washington, D.C. callers will not need the area code.
3. If the line is busy, call the other number.
4. If there is no answer after two rings, call again later.
5. After the initial connection, answer the request for information at the prompts and assign your own password. Subsequent calls will only require providing your first name, last name, and password.

### Purpose of the CALS BBS:

The objective is to provide a means for timely dissemination of information about and related to the CALS program, and to enable the CALS community to exchange information and computer files rapidly and effectively.

Toward these ends CALS core standards and specification are available for downloading as are many files of information useful to the CALS community. The bulletin system provides timely information on meetings, conferences, sources, and other useful subjects. The messaging system provides a convenient means of timely communication to specific users or the entire user community. Messages can be restricted to reading by only the intended recipient.

The following pages provide examples of the bulletin listing, a partial listing of files available for downloading, and part of an available file which lists principal contact points in the CALS community.



**BIOGRAPHICAL SKETCHES OF SPEAKERS  
CALS PHASE I.1 CORE REQUIREMENTS  
JOINT DOD/INDUSTRY/NBS CONFERENCE  
26 APRIL 1988**

**Charles R. Adams  
President  
West Coast Information Systems, Inc. (WESCO)**

Mr. Adams is the President of West Coast Information Systems, Inc. (WESCO), a company with a track record for successfully designing, developing and integrating hardware and software for custom systems and product development. Mr. Adams has extensive background in the implementation of information management systems using optical disks for mass storage. The company (WESCO) has interfaced raster based information systems with various CAD/CAM systems using CCITT Group 3 and 4 compression as well as IGES. Prior to starting WESCO, Mr. Adams was the Manager of Large Format Systems at Integrated Automation. Mr. Adams is a graduate of the Naval Academy and did his graduate work in Management at the University of Tennessee.

**Daniel R. Benigni  
Computer Scientist  
National Bureau of Standards**

Daniel R. Benigni received his Bachelor's degree in Mathematics from St. Vincent College ('69) and has two Master of Science degrees, in Computer Sciences ('81) and Technical Management ('88), both from The Johns Hopkins University. He is a Computer Scientist at the National Bureau of Standards, in the Institute for Computer Sciences and Technology. He is the newly-elected Treasurer of the Washington section of the IEEE, the Institute for Electrical and Electronics Engineers, as well as being General Chairman of the Federal Data Management Users Group. He is on the Board of Directors of the annual Computer Assurance Conference, and is the current Secretary/Treasurer of the Washington chapter of the IEEE Computer Society. His current research interests include computer graphics software and standards; the utilization of graphics standards within the Defense Department's Computer-aided Acquisition and Logistic Support program, which will permit in future the total digital interchange of information between DoD and contractors; and Hypertext. Previously, Mr. Benigni was a Mathematician at the David W. Taylor Naval Ship R&D Center, involved in the analysis, design and development of large data management systems for interactive ship design.



**David S. Bettwy**  
**Automated Production Technology Division**  
**National Bureau of Standards**

Mr. Bettwy is Deputy Chief of the Automated Production Technology Division at the National Bureau of Standards (NBS). Mr. Bettwy has a BSME degree from George Washington University, has been with NBS for 11 years, and previously was with the Harry Diamond Laboratories (HDL) of the Army Materiel Command for 25 years.

Mr. Bettwy's assignments at HDL included electro-mechanical R&D in the area of ordnance devices; responsibility for the HDL manufacturing facility as Chief of the Engineering Technology Branch and for the HDL technical data repository as Chief of the Configuration Management Branch; and Commodity Manager for the acquisition of production quantities of electronic fuzes for artillery rounds.

Prior to his association with the CALS project at NBS, Mr. Bettwy was involved with the planning and installation of the Center for Manufacturing Engineering's Automated Manufacturing Research Facility.

**Karen F. Gregory**  
**DLA CALS Management Support**  
**Defense Logistics Agency**

Ms. Gregory's current position is with the Defense Logistics Agency's (DLA) Computer-aided Acquisition and Logistic Support (CALS) Management Support Office. She is responsible for the DLA CALS Implementation Plan and oversees several CALS projects and demonstration applications. Ms. Gregory is an active member of DOD/Industry CALS committees and sub-committees, including the Information Technology Committee, the Benefits Sub-committee, and the Test Network group.

**Gerard C. Hoffman  
Specification Control Advocate General  
U. S. Navy**

In February 1985, the Secretary of the Navy announced the appointment of Mr. Gerard C. Hoffmann (SES) as the Navy's Specification Control Advocate General. Mr. Hoffmann reports to the Assistant Secretary of the Navy, Shipbuilding and Logistics. The mission of his office is a multi-pronged attack aimed at reducing costs while maintaining or improving quality in all aspects of acquisition, maintenance and support. ACTION '88, "Attack Costs Through Improvements in our Navy/Marine Corps," encompasses Acquisition Streamlining, Value Engineering, Off-The-Shelf Procurements (Non-Developmental Items), Productivity Improvement and the Specifications and Standards Program.

Mr. Hoffmann comes to the position with extensive experience in weapons systems acquisition with tours in several major weapons system acquisition program offices including auxiliaries, destroyers, aircraft carriers, and special mission ships. He holds a Bachelor's Degree in Marine Engineering from the State University of New York Maritime College and did his graduate work at Rensselaer Polytechnical Institute. Currently, he is teaching an acquisition management course for Virginia Tech.

**Jean M. Lamb  
Headquarters Army Materiel Command**

Ms. Lamb is a Logistics Manager working on the CALS program in the Deputy Chief of Staff for Readiness at Headquarters Army Materiel Command. Previous weapon system experience includes work on fielding the APACHE helicopter and the FIREFINDER radar systems. Information system experience includes participating in the conversion to the Commodity Command Standard System. In addition to employment at the Headquarters, Jean has worked at Communications-Electronics Command, at the Aviation Systems Command, and at the St. Louis Army Ammunition Plant.

Ms. Lamb is a graduate of the Army's Logistic Executive Development Course and is currently participating in the Logistics and Acquisition Management Program. She is an active member of the local chapter of the Society of Logistics Engineers.

**Melvin S. Lammers**  
**Air Force Logistics Command**  
**Wright Patterson Air Force Base**

Melvin S. Lammers is currently assigned as Chief of the Architecture and Technology Division in the Air Force Logistics command at Wright Patterson Air Force Base. He is responsible for interface with industry, university, and government research laboratories to advance the use of technology in information systems, computing and communications systems in the Air Force Logistics Command (AFLC). He is responsible for the development of the AFLC-wide system architecture, and is also responsible for the Computer-aided Acquisition and Logistic Support (CALS) Test Network (CTN) for the Department of Defense. Previously he was Chief of the Management Systems Division at AFLC. He has extensive background in computer system design and project management. He graduated from the Ohio State University with a degree in Industrial Engineering and is a 1981 graduate of the Industrial College of the Armed Forces in Washington, D.C.

**Bruce Lepisto**  
**Deputy Director, DoD CALS Policy Office**  
**OASD(P&L)WS**  
**The Pentagon**

Bruce Lepisto is the Deputy Director of the Computer-aided Acquisition and Logistic Support (CALS) Policy Office, in the Office of the Secretary of Defense (OSD). He has been involved with the CALS program since its inception, and was Co-editor of the original Institute for Defense Analysis (IDA) CALS Study report that led the Department of Defense to establish the CALS program.

Mr. Lepisto is a career DoD employee with over twenty years experience in both acquisition and operational logistics. Prior to joining the OSD staff in 1984, he worked for the United States Air Force, most recently as Deputy Director for Data Management of the JLC's Joint Depot Maintenance Analysis Group (JDMAG). His Air Force professional experience includes depot posture planning, support policy, data system design and management, and productivity and cost analysis. He is a senior member of the Society of Logistics Engineers, a member of the Steering Committee of the national IGES/PDES Organization, and a member of the ANSI/ASME Y14.26 committee on Computer Aided Preparation of Product Definition Data.

**Dr. Michael F. McGrath  
Director, DoD CALS Policy Office  
OASD(P&L)WS  
The Pentagon**

Michael F. McGrath is the Director of the Computer-aided Acquisition and Logistic Support (CALS) Policy Office, in the Office of the Secretary of Defense (OSD). He has over seventeen years of acquisition logistics experience dealing the with problems that CALS is designed to address. His previous assignments on the OSD staff included reviewing major weapon system support programs for the Defense Systems Acquisition Review Council (DSARC) and serving as principal author of the top level DoD policy directive on Integrated Logistic Support.

Prior to joining the OSD staff in 1980, Dr. McGrath held various logistic management positions in the Defense Logistics Agency and the Naval Air Systems Command. Dr. McGrath is a member of the Senior Executive Service. He holds B.S. and M.S. degrees in Space Science and Applied Physics, and a Ph.D. in Operations Research. He is a member of the Operations Research Society of America, and a senior member of the Society of Logistics Engineers. In his spare time, he teaches Operations Research courses at George Washington University.

**W. Bradford Rigdon  
McDonnell Douglas Aerospace Information Services**

Brad Rigdon holds the position of General Manager of McDonnell Douglas Aerospace Information Services (MDAIS) Company. MDAIS is a component of the MDC Aerospace Group with the mission to propose and provide Information Services which support Aerospace Component business objectives and contribute to MDC earnings.

Brad entered the data processing field in 1961, joining McDonnell Automation Company (McAuto) a year after it became a division. He became a Senior Consultant and held a variety of management positions in systems services and marketing in New York, including Regional Director of the Northeast Region. Brad has also been a Director of Product Planning, of Product Management and of Business Applications for McAuto in Long Beach. In 1980 he was named Director of McDonnell Douglas Corporation services, in 1983 Vice President of the MDC Services organization of McAuto and General Manager of MDAIS in 1986.

Brad was graduated in 1961 from the University of Missouri with a BA in business administration. Brad is currently a member of the Executive Committee of the Regional Consortium for Education and Technology, Chairman of the Science and Engineering Committee of the St. Louis Regional Commerce and Growth Association, a member of the University of Pennsylvania Wharton School Management Information Forum and a member of the Board of Catholic Education of the Archdiocese of St. Louis.

**Bradford M. Smith  
Center for Manufacturing Engineering  
National Bureau of Standards**

Mr. Bradford M. Smith is Leader of the Engineering CAD/CAM Group in the Automated Production Technology Division at the National Bureau of Standards (NBS). He serves as the Program Director for the Initial Graphics Exchange Specification (IGES)/Product Data Exchange Specification (PDES) project which has focused the efforts of over 750 experts from 280 companies to develop a generic method of data exchange among differing graphics systems. The concept is well documented, widely implemented and is seeing production usage in design, engineering and manufacturing. His work at NBS entails research on integrated manufacturing systems including the development of control strategies, graphics applications software, geometric modeling techniques, interface standards and guidelines.

Prior to joining NBS in November 1976, Mr. Smith headed a group at the Naval Ship Research and Development Center responsible for a developmental program in numerical control systems. Over a ten year period, he supervised the development and maintenance of computer software used to direct NC machine tools at two Navy Laboratories. While in the Navy, Mr. Smith served as Chairman of the DoD Manufacturing Technology Advisory Group Subcommittee on CAD/CAM which annually reviewed all proposed projects for technical feasibility and possible duplication of effort.

Mr. Smith holds a Bachelor's (65) and a Master's (66) Degree in Electrical Engineering from Cornell University. He has served as Chairman of the Washington, D.C. Chapter of the Numerical Control Society. In 1979, he was the recipient of the Archimedes Engineering Achievement Award from the California State Society of Professional Engineers, and from 1981-84 served on the Board of Directors of the Numerical Control Society.

Currently, he is Chairman of the International Organization for Standardization (ISO) Technical Committee 184 Subcommittee 4 on product data exchange and Chairman of the American National Standards Institute Planning Panel on Industrial Automation.

**Harold B. Stormfeltz  
Northrop Corporation  
Aircraft Division**

Harold B. Stormfeltz (Stormy) is currently the manager of the Advanced Systems Support Programs Department. In this position he is responsible for developing Advanced Aircraft Supportability Programs and the activities of the Support Technology Development Center. Prior to his current position he was the ILS Director for the company funded F-20 Programs which included developing unique contractor operated support programs worldwide.

In his previous assignment as manager of the F-5/T-38 support programs, he directed the company's support efforts worldwide in 24 different countries. In 1972 he established an Integrated Logistics Support Group to develop international support plans for the COBRA Aircraft, European consortium. Before transferring from Engineering to the Logistics Department his assignments included being a resident member of the technical consultant team for the NATO Hawk Weapon System and special assignments involving acquisition of European - developed weapons.

Stormy joined Northrop in 1955 as a Mechanical Design Engineer. He earned a Bachelor of Science in Aeronautical Engineering from UCLA.

Stormy has been involved in NSIA's LOMC activities since 1972. He served as chairman of the spares and product support groups and subsequently chairman of LOMC. In the fall of 1986 as a result of DOD's Computer Aided Acquisition and Logistics Support (CALS) initiative he became LOMC's representative to newly formed CALS Industry Steering Group (ISG). Recently he was appointed Vice Chairman for Operations, having the responsibility for coordinating the efforts of the CALS Task Groups.

**Colonel Eugene L. Tattini  
Director of Plans and Programs  
Headquarters Air Force Systems Command**

Colonel Eugene L. Tattini is Director of Plans and Programs, Deputy Chief of Staff Product Assurance and Acquisition Logistics, Headquarters Air Force Systems Command, Andrews Air Force Base, Maryland.

Col. Tattini [REDACTED] graduated from high school in Hampton, Virginia in 1961, and then attended the University of Illinois, Urbana, Illinois, where, in 1965, he received a Master's degree in Business Administration from Oklahoma City University. He is a graduate of Squadron Officer School, Air Command and Staff College, Industrial College of the Armed Forces, and Air War College.

Col. Tattini received his commission through the Reserve Officer Training Corp. (ROTC) program at the University of Illinois in 1965. From September 1965 through February 1968, he was assigned as the Executive Officer for the 58th Air Rescue Squadron, Wheelus AB, Tripoli, Libya.

From March 1968 through September 1969, he was a Deputy Missile Combat Crew Commander, 321st Strategic Missile Wing, Grand Forks AFB, North Dakota. During 1970-1971, Col. Tattini was the Aide-de-Camp to the Vice Commander, 15th Air Force, March AFB, California.

In February 1972, Col. Tattini transferred to Oklahoma City Air Logistics Center, Tinker AFB, Oklahoma, where he was assigned as the Director of Logistics, 6171st Air Base Squadron, Kwang Ju AB, Korea.

After graduation from Staff College in June 1977, Col. Tattini spent the next four years as the Deputy Program Manager for Logistics, Space Defense System Program Office, Space Division, Los Angeles AFB, California. In July 1981, he was assigned to Headquarters, United States Air Force, Washington, D.C., as an Acquisition Logistics Policy Staff Officer. He assumed his current duties with Air Force Systems Command in July 1985.

He was promoted to Colonel on 1 September 1985.

[REDACTED]







# **DoD Initiatives in Computer-Aided Acquisition and Logistic Support**

**MICHAEL McGRATH  
OFFICE OF THE SECRETARY OF DEFENSE**

8-3889

# **CALS POLICY INITIATIVE**

## **(DEPSECDEF MEMO - SEPT 1985)**

### **OBJECTIVES**

- **ACCELERATE INTEGRATION OF R&M DESIGN TOOLS INTO CONTRACTOR CAD/CAE SYSTEMS**
- **AUTOMATE CONTRACTOR PROCESSES FOR GENERATING LOGISTIC TECHNICAL INFORMATION**
- **RAPIDLY INCREASE DoD CAPABILITY TO RECEIVE, DISTRIBUTE AND USE TECH INFO IN DIGITAL FORM**
  - **BY 1990, NEW MAJOR WEAPON SYSTEMS WILL ACQUIRE TECHNICAL INFORMATION IN DIGITAL FORM**

# SCOPE

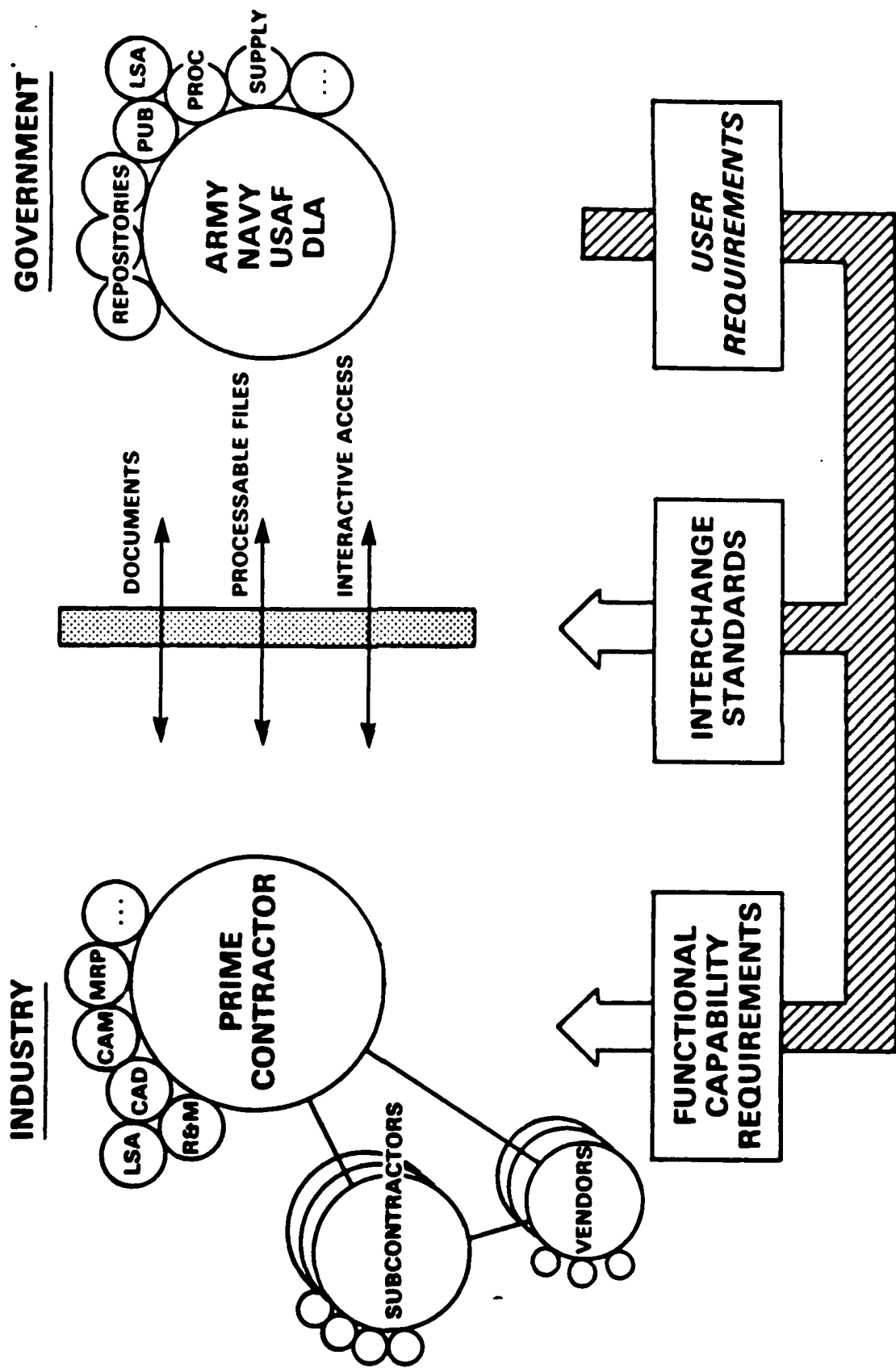
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- **TECHNICAL DATA BASE DEFINITION AND ACCESS**
  - 1. PRODUCT DEFINITION DATA BASE
  - 2. INTEGRATED SUPPORT DATA BASE
- **DIGITAL DATA INTERCHANGE**
  - \*1. PRODUCT DEFINITION DATA
  - \*2. LSA/LSAR
  - \*3. TECHNICAL MANUALS
  - 4. TRAINING MATERIALS
  - 5. TECHNICAL PLANS AND REPORTS
  - 6. OPERATIONAL FEEDBACK DATA
- **INTEGRATION OF PROCESSES**
  - \*1. R&M INTEGRATION IN CAD/CAE

\*MAJOR THRUST AREAS IN PHASES I.0 - I.1

8 1889

# DIGITAL INFORMATION EXCHANGE



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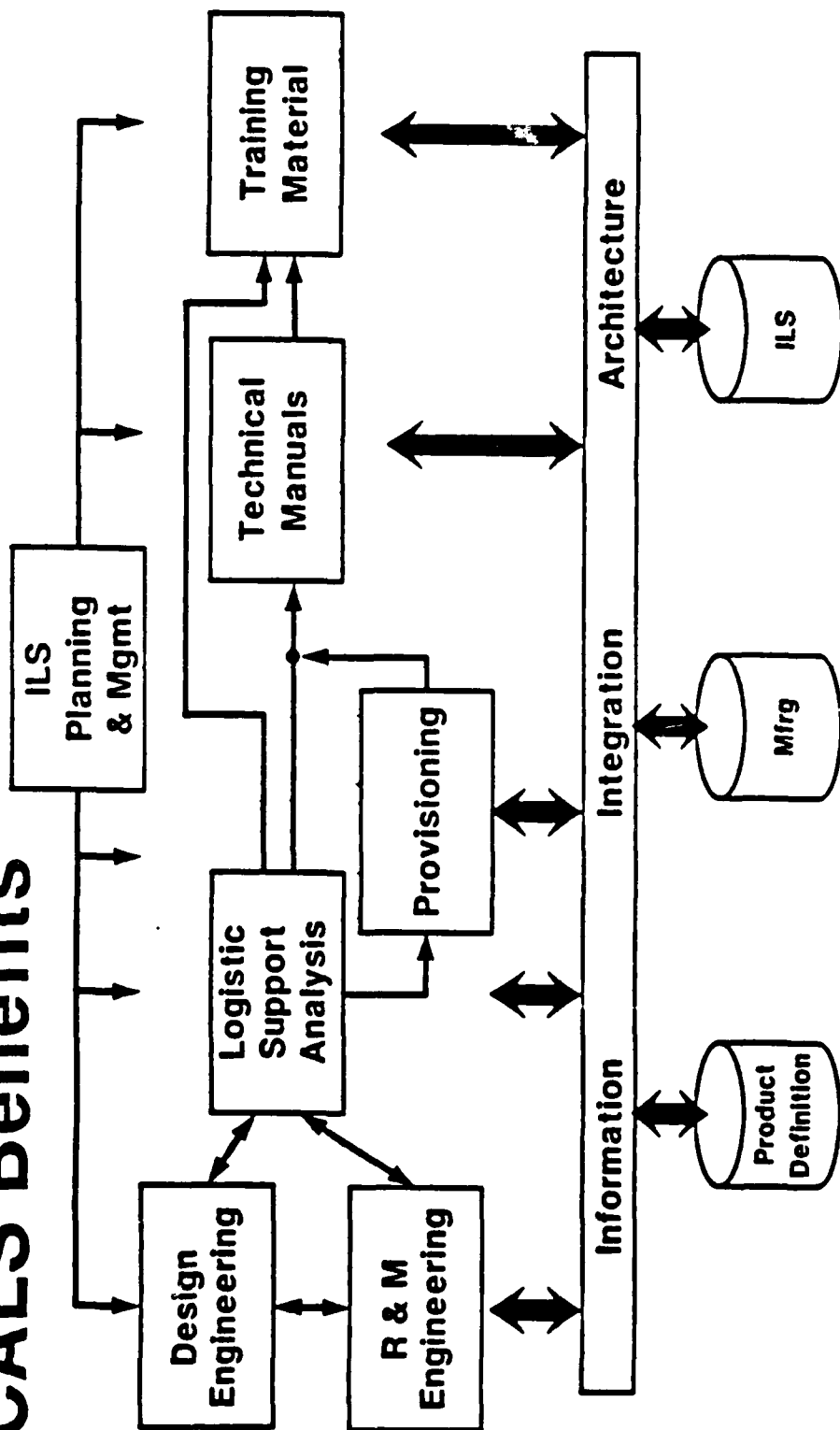
# **FY 87 ACCOMPLISHMENTS**

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- **PHASE 1.0 CORE REQUIREMENTS RELEASED**
  - STDS FOR ENGRG DWGS, TECH MANUALS, LSAR
  - EXCEPTIONAL INDUSTRY INVOLVEMENT, SUPPORT
- **LEAD WEAPON SYSTEMS DESIGNATED**
  - SSN-21, V-22, ATA, ATF, LHX
  - JLC SUPPORT
- **SERVICE TECHNOLOGY DEMOS FUNDED**
  - BEGINNINGS OF CALS DISTRIBUTED TEST BED
- **INCLUSION OF CALS IN DoD INFRASTRUCTURE MODERNIZATION**
  - ARMY CALS, NAVY CAD, DSREDS/EDCARS, EDMICS
- **STRATEGY FORMULATED FOR CALS IMPLEMENTATION**
- **INDUSTRY WORKING GROUPS ACTIVATED**

H 3889

# CALS Benefits



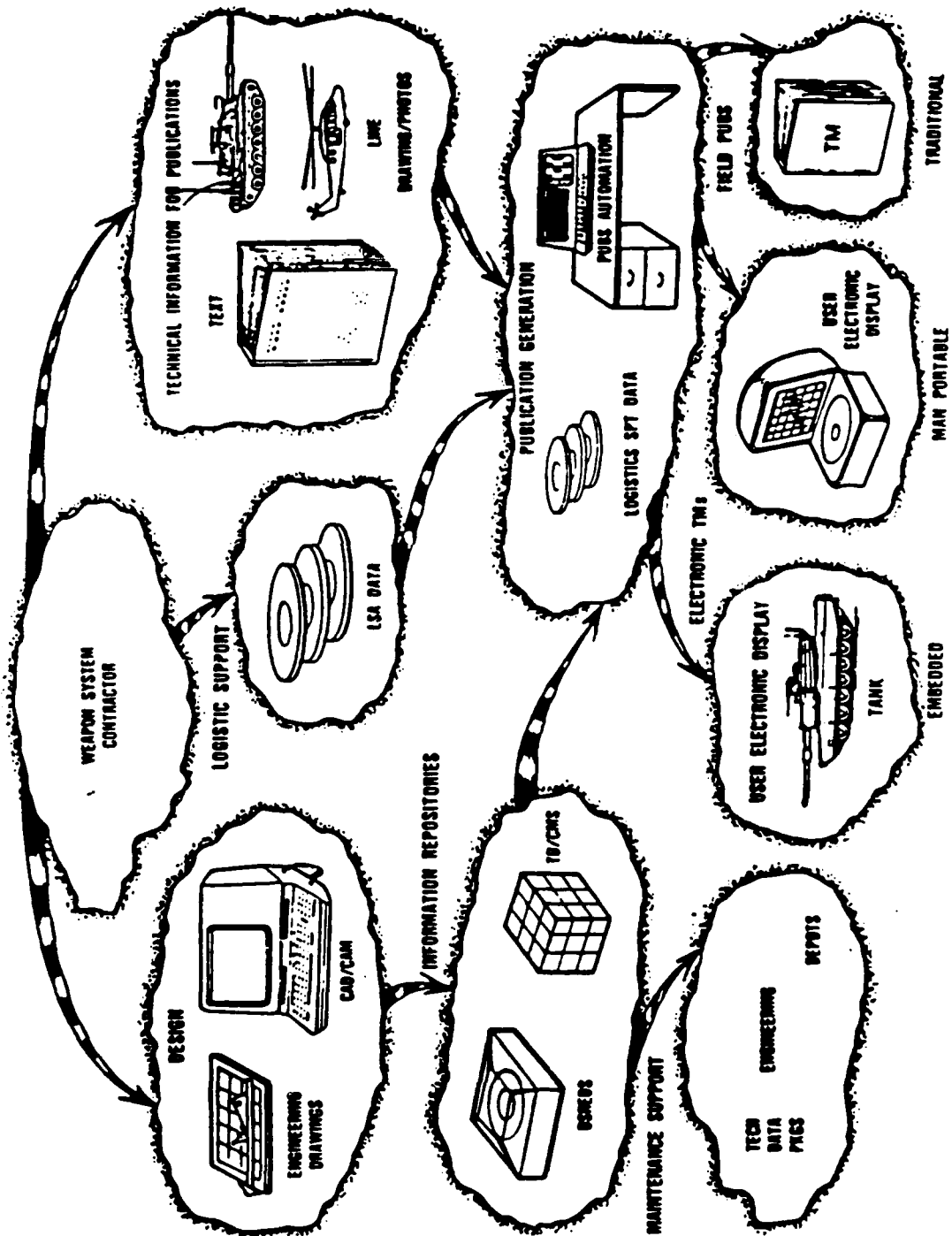
*“Integrated Logistics Processes”*

**Require**

*“Integrated Information”*

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# ARMY CALS CONCEPTUAL LINKAGE



# **WHAT IS CALS?**

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**CALS IS A DoD AND INDUSTRY STRATEGY TO ENABLE AND ACCELERATE THE INTEGRATION OF DIGITAL TECHNICAL INFORMATION FOR WEAPON SYSTEM ACQUISITION, DESIGN, MANUFACTURING AND SUPPORT.**

**CALS WILL PROVIDE LONG-TERM PRODUCTIVITY AND QUALITY GAINS THROUGH:**

- **STREAMLINING CRITICAL FUNCTIONS**
- **ELIMINATING REDUNDANT TASKS AND DATA**
- **IMPROVING OPERATIONAL EFFECTIVENESS**
- **REDUCING LEAD TIMES AND COSTS**

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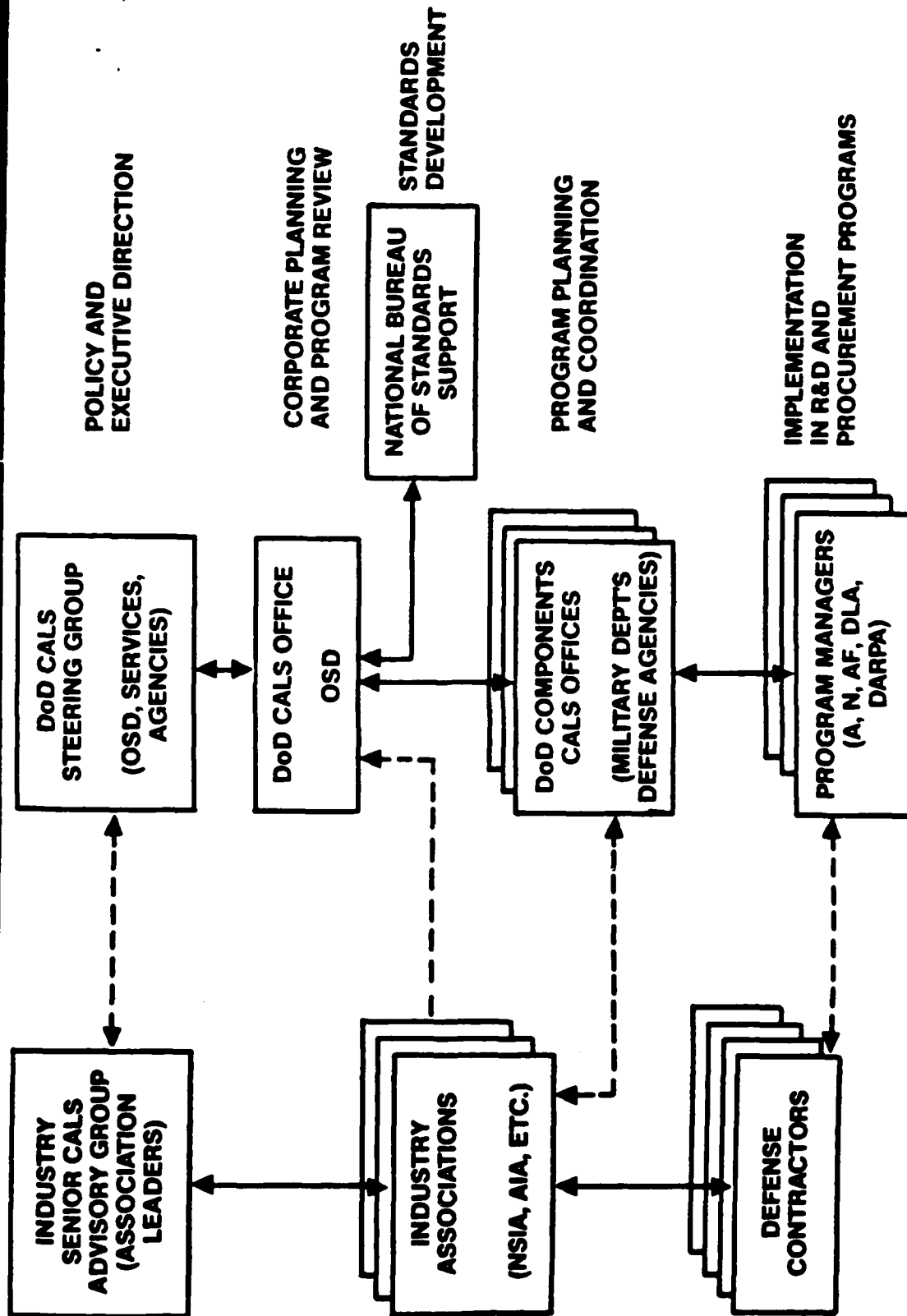


# CALS STRATEGY

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- **STANDARDS**
  - DEVELOP AND TEST STANDARDS FOR DIGITAL TECHNICAL DATA INTERCHANGE AND INTEGRATED DATA BASES
- **TECHNOLOGY**
  - SPONSOR TECHNOLOGY DEVELOPMENT AND DEMONSTRATIONS FOR INTEGRATION OF TECHNICAL DATA PROCESSES AND INTEGRATION OF RELIABILITY AND MAINTAINABILITY WITH DESIGN
- **CONTRACTS AND INCENTIVES**
  - IMPLEMENT CALS STANDARDS IN WEAPON SYSTEM CONTRACTS AND ENCOURAGE INDUSTRY INVESTMENT
- **INFRASTRUCTURE AND ARCHITECTURE**
  - IMPLEMENT CALS STANDARDS AND INTEGRATION REQUIREMENTS IN DoD INFRASTRUCTURE, ARCHITECTURE PLANNING, AND MODERNIZATION

# MANAGEMENT



0. 3000

# **CALS CORE REQUIREMENTS PACKAGES**

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## **PHASE I**

- **FOCUS ON**
  - **A FEW MAJOR LOGISTICS APPLICATIONS**
  - **AVAILABLE TECHNOLOGY, STANDARDS**
  - **PRIMARILY "RECORDS TRANSFER" ENVIRONMENT**

## **PHASE II**

- **FOCUS ON**
  - **WIDER RANGE OF DESIGN, MFG, LOGISTICS APPLICATIONS**
  - **MORE ADVANCED TECHNOLOGY, STANDARDS**
  - **CENTROID IS ADVANCED PRODUCT DATA MODELS**
  - **PRIMARILY "ONLINE ACCESS" ENVIRONMENT**

# CALS CORE DOCUMENTS

## ● STANDARDS

- MIL-STD-1840A, "AUTOMATED INTERCHANGE OF TECH INFO" — 22 DEC 87
- MIL-D-28000, "DIGITAL REPRESENTATION FOR COMMUNICATION OF PRODUCT DATA: IGES APPLICATION SUBSETS" — 22 DEC 87
- MIL-M-28001, "MARKUP RQMTS...ELECTRONIC PRINTED OUTPUT AND EXCHANGE OF TEXT" — 26 FEB 88
- MIL-R-RASTER, "RASTER GRAPHICS..." (DRAFT)
- MIL-D-CGM, "DIGITAL REPRESENTATION...ILLUSTRATION DATA: CGM APPLICATION PROFILE" (DRAFT)

## ● IMPLEMENTATION GUIDE

- MIL-HDBK-XXX, "CALS IMPLEMENTATION GUIDE" (DRAFT)
- POLICY MEMORANDUM
- DEPSECDEF MEMO, "CALS IMPLEMENTATION" (DRAFT)

**8-3824**

# **CALS IMPLEMENTATION POLICY**

## **(DRAFT DEPSECDEF MEMO)**

---

- **SYSTEMS NOW IN FSD OR PRODUCTION**
  - **REVIEW COST SAVING AND QUALITY OPPORTUNITIES FROM CHANGING TO DIGITAL DELIVERY OR ACCESS**
- **SYSTEMS ENTERING DEVELOPMENT AFTER SEP 1988**
  - **REQUIRE PROPOSALS FOR CALS DATA DELIVERY OR ACCESS**
- **INFRASTRUCTURE SYSTEMS**
  - **PROGRAM RESOURCES FOR SYSTEMS TO RECEIVE AND USE DIGITAL DATA**
  - **CONFIGURE OR ADAPT SYSTEMS TO SUPPORT CALS STANDARDS**
- **ACQUISITION POLICY**
  - **USD(A) WILL ISSUE FURTHER GUIDANCE ON CONTRACTING, INCENTIVES, SUBCONTRACTORS, FUNDING MECHANISMS.**

8-3824

# **CALS PHASE II STRATEGY**

---

- **INDUSTRY HAS AS MUCH AT STAKE AS DoD**
- **PRIME-PRIME, PRIME-VENDOR LINKS ARE ESSENTIAL TO STAY COMPETITIVE**
- **INDUSTRY INVESTMENT WILL BE ORDERS OF MAGNITUDE GREATER THAN IN-HOUSE DoD INVESTMENT**
- **DATA BASE SHARING PRESENTS A NEW PLATEAU OF TECHNICAL AND MANAGEMENT PROBLEMS, BUT PAYOFFS ARE HIGH**
- **PREFERRED MODE IS FOR DoD TO ADOPT A COMMON INDUSTRY-DEVELOPED APPROACH, RATHER THAN VICE VERSA**

# **PDES DEVELOPMENT**

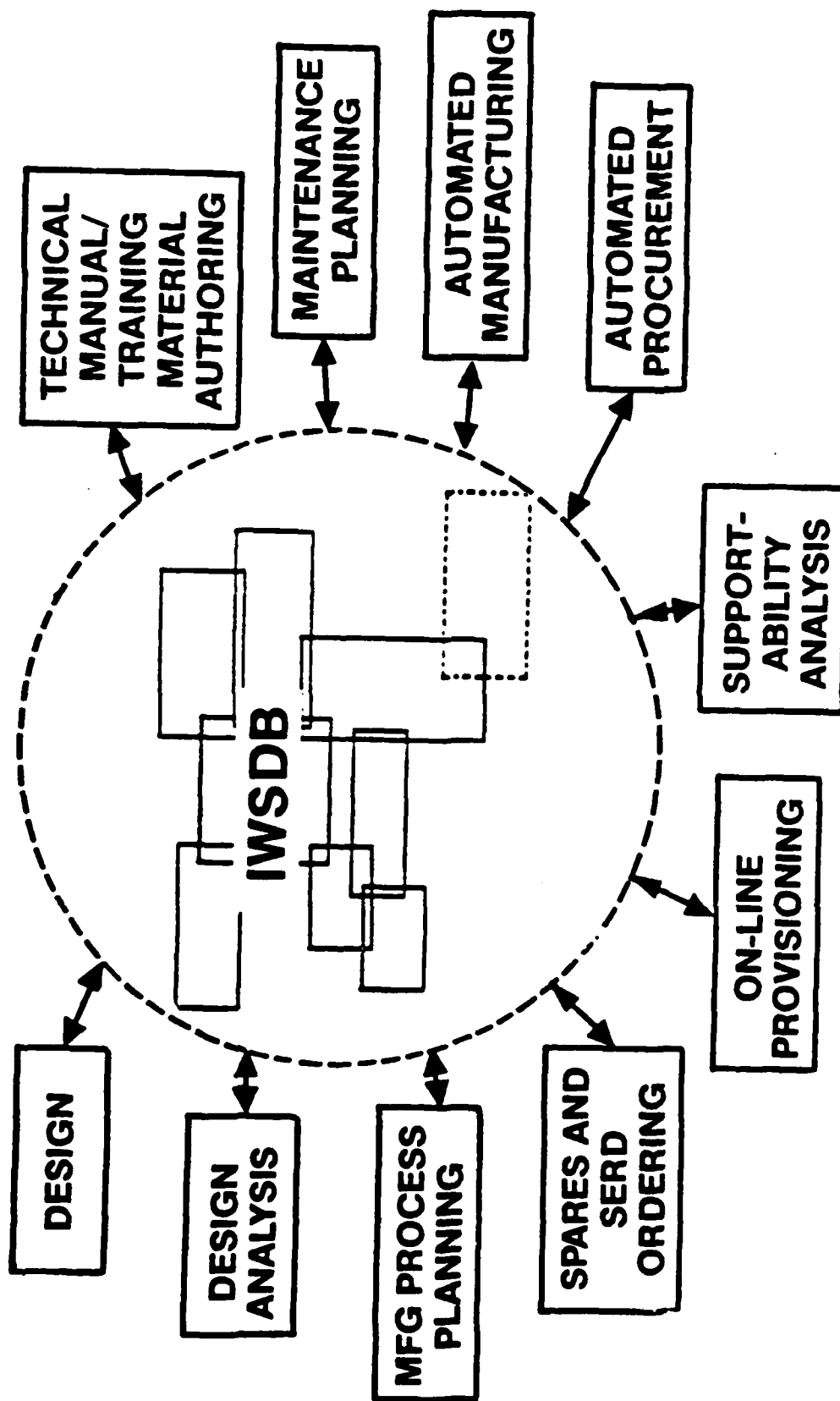
---

- **INDUSTRY PDES COOPERATIVE**
  - **DEVELOP AND DEMONSTRATE PRAGMATIC, IMPLEMENTABLE SPECIFICATIONS**
  - **INDUSTRY FUNDED**
- **GOVERNMENT PDES USERS GROUP**
  - **COORDINATE DoD AND OTHER AGENCY IMPLEMENTATION**
  - **COMMON INTERFACE WITH INDUSTRY**
- **NBS-LED IGES/PDES ORGANIZATION**
  - **VOLUNTEER EFFORT BY USERS, VENDORS TO DEFINE CURRENT PDES BASELINE**
  - **NBS COORDINATION OF STANDARDIZATION EFFORTS**
- **GOVERNMENT FUNDED TECHNOLOGY DEVELOPMENT**
  - **FOCUSED TOWARD COMMON OBJECTIVES**
  - **COORDINATED BY GOV'T PDES USERS GROUP**

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# CALS INTEGRATION TARGET

## INTEGRATED WEAPON SYSTEM DATA BASE (IWSDB)



-----  
STANDARD INTERFACE  
THROUGH DATA DICTIONARY



# MAJOR THRUSTS FOR FY-88

---

- TESTING OF PHASE I STANDARDS
- TRIAL CONTRACTUAL IMPLEMENTATIONS
- EXPANSION OF PHASE I CORE
  - FUNCTIONAL REQUIREMENTS (R&M INTEGRATION,...)
  - TECHNICAL STANDARDS (CGM, ODA/ODIF,...)
  - APPLICATION AREAS (TRAINING, TECH DATA PACKAGES,...)
- GROUNDWORK FOR PHASE II CORE
  - INDUSTRY CO-OP FOR PDES DEVELOPMENT
  - GOVERNMENT COORDINATION GROUP
- DEVELOPMENT OF INTEGRATING ARCHITECTURES
- CONTINUED WORK WITH INDUSTRY TASK FORCE ON CALS IMPLEMENTATION ISSUES

# NEAR TERM ACTIONS

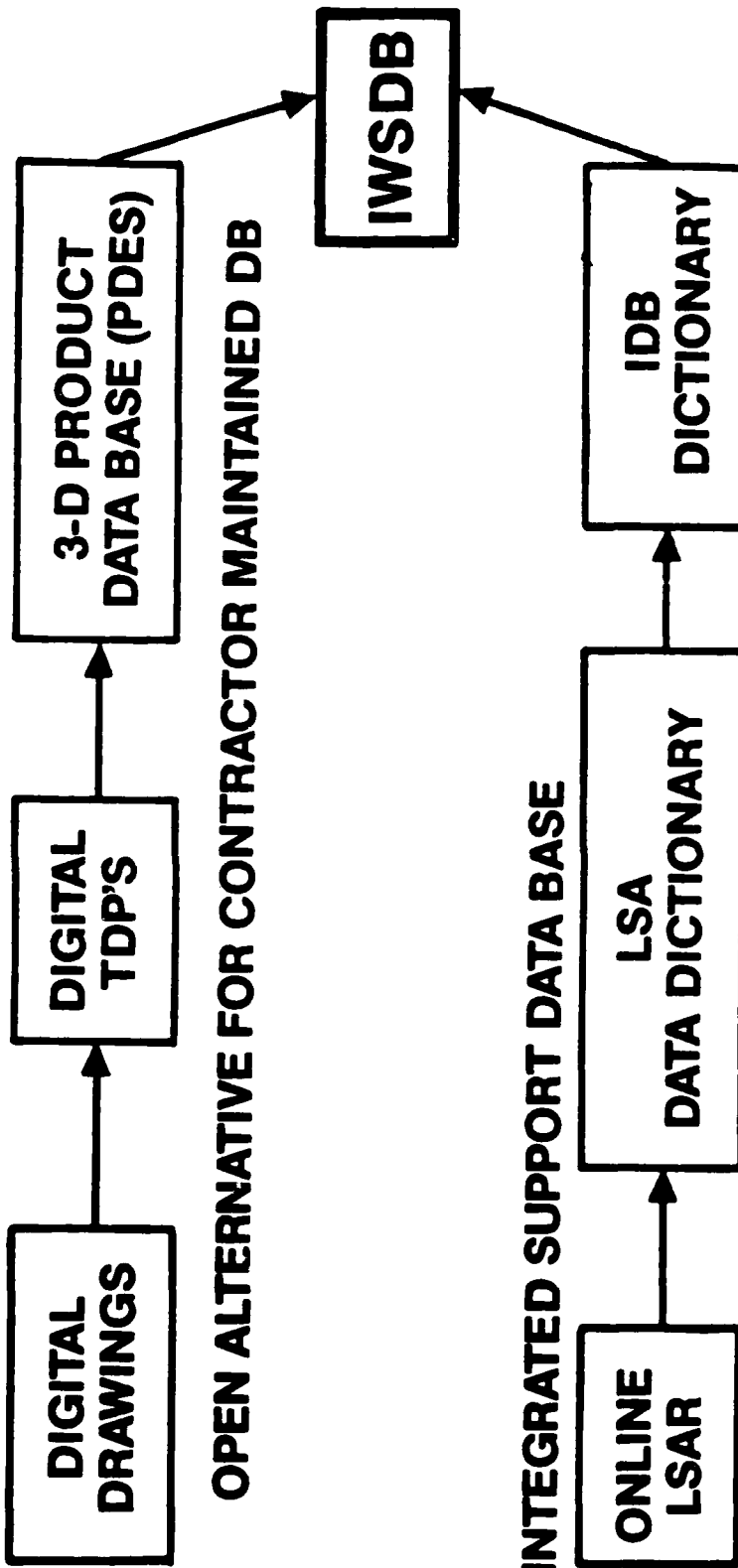
- PHASE I.1 CORE REQUIREMENTS
  - FOR COORDINATION MEETING 26 APR 88
  - RECONCILIATION MEETINGS SEP-OCT 88
  - PUBLICATION DEC 88
- CALS PLANNING
  - REPORT TO CONGRESS JUN 88
  - CALS TESTING NETWORK JUL 88
  - CALS MASTER PLAN OCT 88
  - CALS TECHNOLOGY PLAN DEC 88
  - ARCHITECTURE GUIDELINES JUN 89
- CALS EDUCATION/PUBLIC COMMUNICATIONS
  - CALS ANNUAL CONFERENCE "EXPO 88" 4-6 OCT 88
  - DSMC CALS PROGRAM MGT MODULE DEC 88

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# CALS MAJOR THRUSTS

## DATA

- PRODUCT DEFINITION DATA



OPEN ALTERNATIVE FOR CONTRACTOR MAINTAINED DB

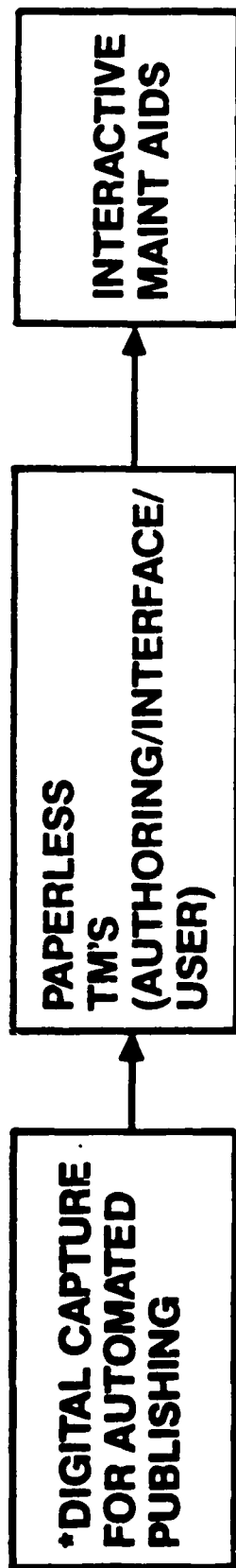
- INTEGRATED SUPPORT DATA BASE

OPEN ALTERNATIVE FOR ONLINE REVIEW & APPROVALS,  
PROVISIONING, ORDERING.

# CALS MAJOR THRUSTS

## APPLICATIONS

- TECHNICAL MANUALS



OPEN ALTERNATIVE FOR ELECTRONIC PRESENTATION OF  
EXPERT SYSTEM TROUBLESHOOTING ROUTINES

- SPARES ACQUISITION
- TRAINING MATERIALS
- OTHERS

6.3824

# ROADMAP FOR INCREMENTAL CALS CORE RELEASES

## STEP ONE—PUBLISH STANDARDS

<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
<u>Product Definition Data</u>			
Engineering Drawings - Raster (Std) - IGES (2 Subsets) (Std)	Engineering Drawings (Additional IGES Subsets)	Standards Elctronics Full Digital Data Package Contractor- Maintained Data Base	PDES
<u>Integrated Support Data Base</u>			
On-Line Access to LSA (Contractor Specific)	SOW Language to integrate R&M With LSA	Initial Data Dictionary and Query Language Std. Functional Std. for IWSDb to Support LSA, R&M, Provisioning, TM Authoring, ISD, Etc.	Expand Data Dictionary to be Compatible with PDES
<u>Technical Manuals</u>			
Digital Capture for Auto. Publishing - SGML Tags - 1 TM Format - Raster Graphics - IGES 1 Subset	Digital Capture - Addn'l TM Formats - CGM Graphics - Initial Paperless Delivery Format	Paperless TM's - Functional Std. for Authoring - Interface Std's (SGML, CGM (Raster)	Integrated Maint. Aid - Interface With Weapon System - Functional Std. for "Intelligent" Maint. Assistance

# IMPLEMENTATION STEPS

## RASTER SCAN OF ENGINEERING DRAWINGS

TECHNOLOGY DEVELOPMENT

DEC 88

DEVELOP/PUBLISH  
STANDARDS

ADVANCED CONTRACT  
IMPLEMENTATION

ROUTINE  
CONTRACT DELIVERY

MAR 89

DEVELOP CONFORMANCE TESTS

JUN 89

USER (END-TO-END) TESTING

JUN 89

DoD INFRASTRUCTURE PLANNING

INCORPORATION IN SYSTEMS

1993

EDCARS/DSREDS

EDMICS

INDUSTRY INFRASTRUCTURE MODERNIZATION

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# **CALS TESTING NETWORK**

---

- **DISTRIBUTED TEST BED**
  - **PARTICIPATION BY SERVICES, OTHER AGENCIES, INDUSTRY**
- **FOCUS ON USER TESTING OF CALS STANDARDS**
  - **STRUCTURED EXPERIMENTS**
  - **"NATURALLY OCCURRING" EXPERIMENTS**
- **EVALUATE EFFECTIVENESS AND BENEFITS IN USER APPLICATIONS**
- **PROVIDE COMMUNICATIONS NETWORK AND DATA BASE TO SHARE TEST RESULTS**
- **FEEDBACK TO IMPROVE STANDARDS AND VENDOR IMPLEMENTATIONS**

# **SERVICE AND DLA PROGRAMS**

---

## **TECHNOLOGY**

- **ADVANCED INFORMATION INTEGRATION**
- **PARTS DATA ACCESS**
- **ELECTRONIC TECHNICAL MANUALS**
- **R&M DESIGN INTEGRATION**

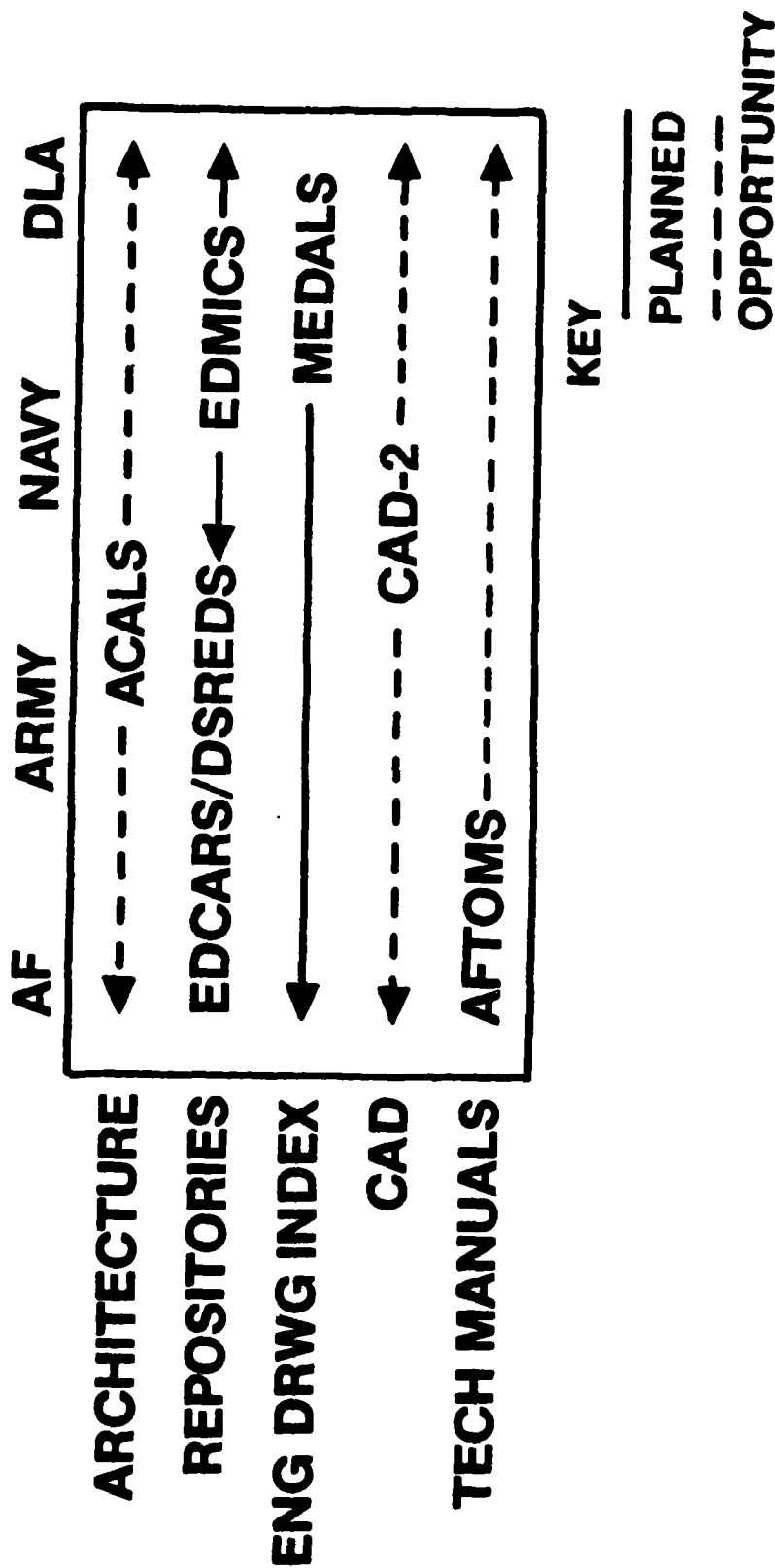
## **INFRASTRUCTURE**

- **PLANNING AND ARCHITECTURE**
- **ENGINEERING DATA REPOSITORIES**
- **COMPUTER-AIDED DESIGN**
- **AUTOMATED TECH MANUALS**
- **INTEGRATED WEAPON SYSTEM DATA BASE**

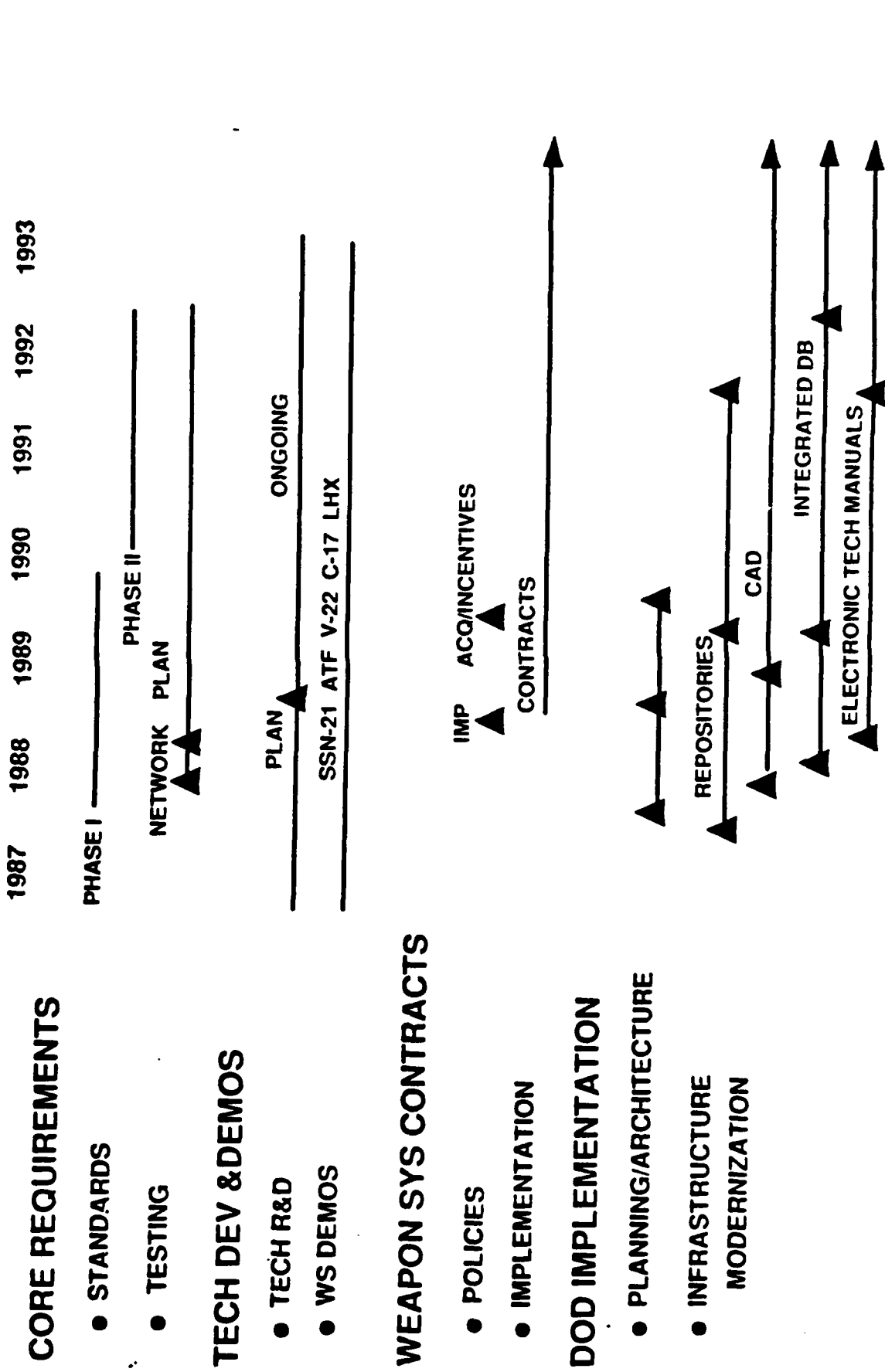
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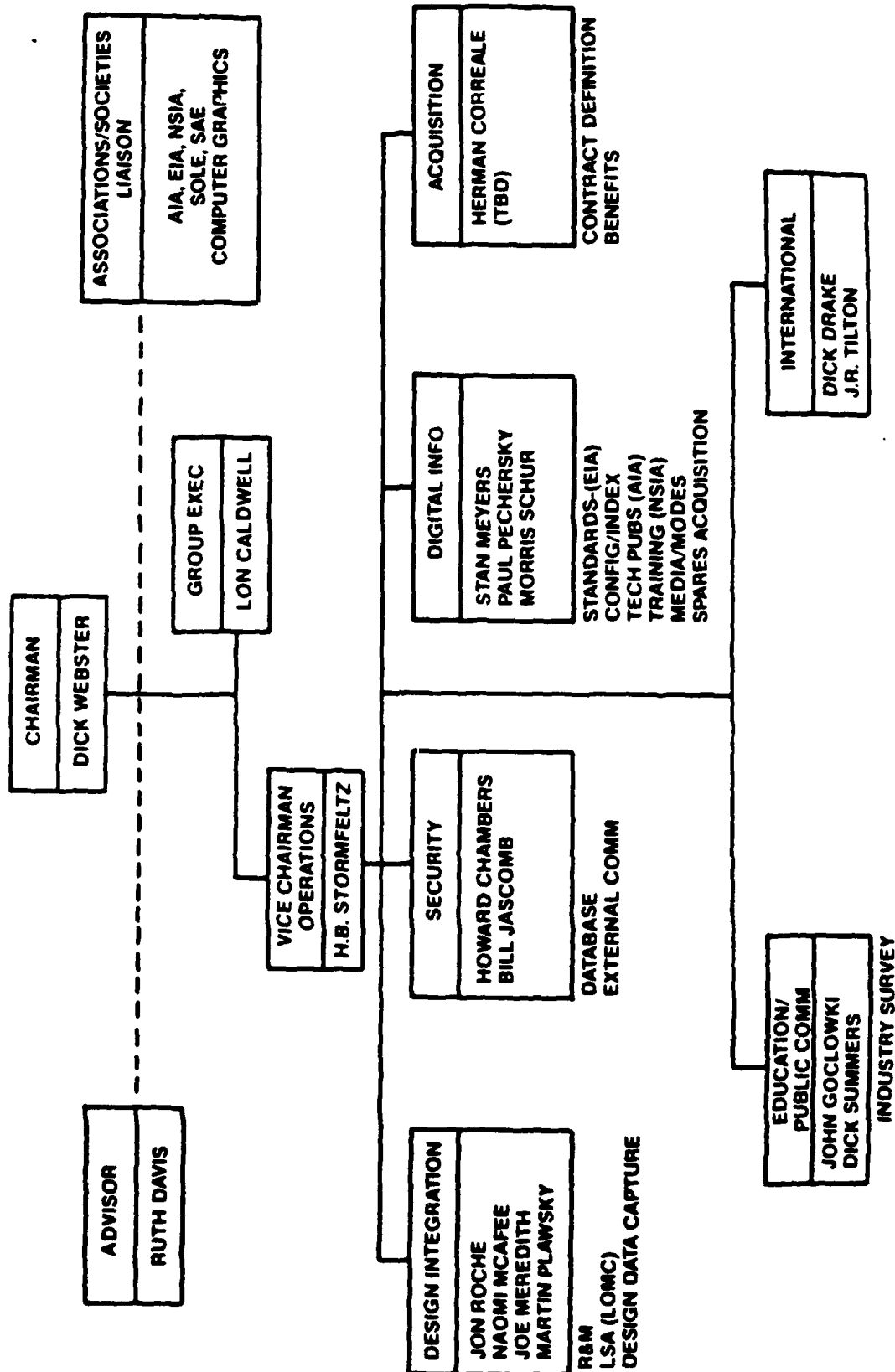
# CONTRIBUTION TO COMMON CALS IMPLEMENTATIONS



# CALS SCHEDULE OBJECTIVES



# INDUSTRY STEERING GROUP (ISG)



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# **1987 CALS R&M SUMMER STUDY RECOMMENDATIONS TO DoD**

---

- **WEAPON SYSTEM DEVELOPMENT CONTRACTS**
  - REQUIRE DISCUSSION OF PROPOSED CAPABILITY IN ITO
  - INCLUDE AS EVALUATION CRITERIA IN SOURCE SELECTION
  - PROPOSED AUTOMATED R&M CAPABILITY TO BE INCLUDED IN CONTRACT
- **INDUSTRY IR&D INCENTIVES**
  - CREATE NEW CATEGORY FOR DEVELOPMENT OF NEW DESIGN PROCESSES
- **GOVERNMENT R&D INVESTMENT**
  - PROTOTYPE TOOL DEVELOPMENT IN HIGH RISK AREAS
  - SHOULD NOT INCLUDE PRODUCTION QUALITY SOFTWARE
- **POLICY STATEMENT**
- **PLAN OF ACTION AND MILESTONES**
- **TRAINING**

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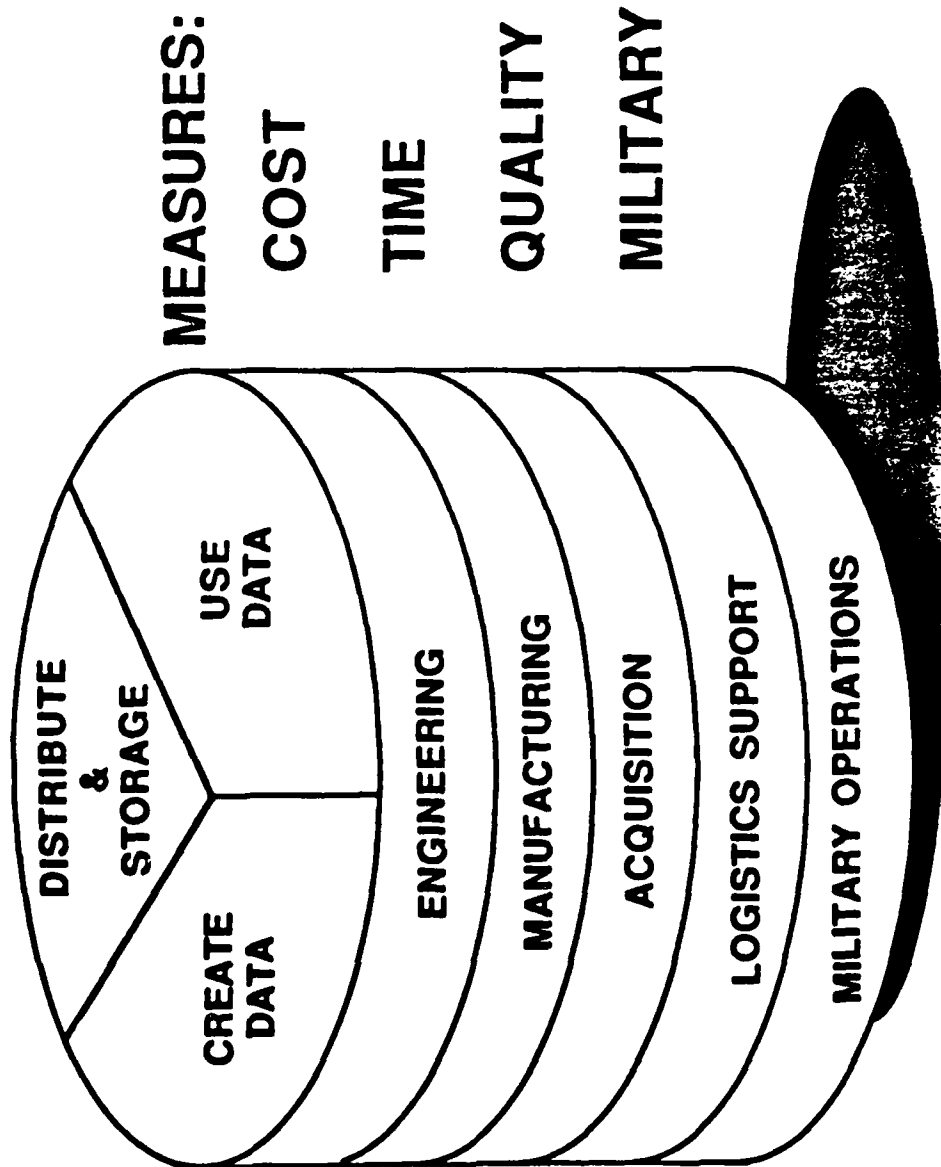
# **CALS IMPLEMENTATION ISSUES**

## **ACQUISITION COMMITTEE CHARTERED**

---

- **RIGHTS TO DATA**
- **SECURITY, PRIVACY, EXPORT CONTROLS**
- **PROFIT STRUCTURE, INVESTMENT INCENTIVES**
- **DELIVERY, VERIFICATION, ACCEPTANCE**
- **LEGAL LIABILITY**
- **CO-OPERATIVE PRODUCTION (OTHER NATIONS)**
- **DAR, FAR REVISIONS**
- **ADP ACQUISITION PROCESS**

# CALS BENEFITS FRAMEWORK



8 3889

# **BENEFITS-EXAMPLES**

---

- **DIGITAL PREPARATION AND DELIVERY**
  - **ELIMINATION OF REDUNDANT DATA/AUTOMATION**
  - **20-30% EXPECTED IN TECHNICAL MANUAL AUTHORIZING AUTOMATION**
  - **35% IMPROVEMENT IN TROUBLESHOOTING ACCURACY**
  - **\$135M POTENTIAL AF ANNUAL SAVINGS IN TECH MANUAL CHANGES**
- **INTEGRATED DATA BASES**
  - **20-35% SAVINGS IN ILS**
  - **OPPORTUNITY TO IMPACT 5-10% OF ACQUISITION COST**
- **REDESIGNED PROCESSES**
  - **TECHNOLOGY OFFERS NEW WAYS OF DOING BUSINESS THROUGH ELIMINATION AND CONSOLIDATION OF PROCESSES**
  - **20% ESTIMATED SAVINGS OVER WEAPON SYSTEM LIFE CYCLE**

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# CONCLUSION

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- DoD IS COMMITTED TO ACHIEVING MAJOR GAINS THROUGH AUTOMATION
- THE CALS RECOMMENDED STRATEGY WILL BE IMPLEMENTED
- WILL REQUIRE CONCERTED PLANNING AND INVESTMENT BY BOTH DoD AND INDUSTRY





**WESCO**

**WEST COAST INFORMATION SYSTEMS, INC.**

**1901 Olympic Boulevard, 3rd Floor, Walnut Creek, CA 94596**

**(415) 930-7700**

**IMPLEMENTATION  
OF  
MIL-R-RASTER**

**Charles R. Adams**

**WESCO 4/26/88**

# **WHAT IS RASTER DATA?**

**WESCO 4/26/88**



**Table 1**  
**Raster Scan Data**

[illegible]

The image in Figure 1 may be encoded into  $30 \times 42 = 1260$  bits. 1's correspond to black pixels, 0's correspond to white pixels. Although normally these 1260 "raster scan" bits would be stored or transmitted purely sequentially, they are arranged here in groups of 42 to emphasize their correspondence with the original image.

**Table 2**  
**Run-Length Encoding of Raster Scan Data**

Line No.	<u>W</u>	<u>B</u>	<u>W</u>	<u>B</u>	<u>W</u>	<u>B</u>	<u>W</u>	<u>B</u>	<u>W</u>	<u>B</u>	<u>W</u>	<u>B</u>	<u>W</u>
1	42												
2	42												
3	42												
4	42												
5	4	3	10	3	22								
6	4	3	9	4	22								
7	4	4	8	4	22								
8	4	4	7	5	22								
9	4	4	7	4	23								
10	4	5	6	4	23								
11	4	5	5	5	9	7	7						
12	4	2	2	2	4	2	1	2	8	9	6		
13	4	2	2	2	4	2	1	2	7	4	3	4	5
14	4	2	2	3	2	2	2	2	6	4	5	4	4
15	4	2	2	7	2	2	6	3	7	3	4		
16	4	2	3	5	3	2	6	3	7	3	4		
17	4	2	3	5	3	2	5	4	7	3	4		
18	4	2	4	3	4	2	5	14	4				
19	4	2	5	2	4	2	5	14	4				
20	4	2	11	2	5	3	15						
21	4	2	11	2	5	3	15						
22	4	2	11	2	6	2	15						
23	4	2	11	2	6	3	8	2	4				
24	4	3	9	3	7	4	5	3	4				
25	4	3	9	4	7	10	5						
26	4	3	9	3	9	7	7						
27	29	3	10										
28	42												
29	42												
30	42												

The image of Figure 1 may be encoded into alternate run lengths of white (W) and black (B) runs, as shown here. The runs are not normally stored by line, as shown here for clarity, since the cumulative line length of 42 serves as an end-of-line delimiter when decoding.

TABLE 2/T.6  
Terminating codes

White run length	Code word	Black run length	Code word
0	00110101	0	0000110111
1	000111	1	010
2	0111	2	11
3	1000	3	10
4	1011	4	011
5	1100	5	0011
6	1110	6	0010
7	1111	7	00011
8	10011	8	000101
9	10100	9	000100
10	00111	10	0000100
11	01000	11	0000101
12	001000	12	0000111
13	000011	13	00000100
14	110100	14	00000111
15	110101	15	000011000
16	101010	16	0000010111
17	101011	17	0000011000
18	0100111	18	0000001000
19	0001100	19	00001100111
20	0001000	20	00001101000
21	0010111	21	00001101100
22	0000011	22	00000110111
23	0000100	23	00000101000
24	0101000	24	00000010111
25	0101011	25	00000011000
26	0010011	26	000011001010
27	0100100	27	000011001011
28	0011000	28	000011001100
29	00000010	29	000011001101
30	00000011	30	000001101000
31	00011010	31	000001101001
32	00011011	32	000001101010
33	00010010	33	000001101011
34	00010011	34	000011010010
35	00010100	35	000011010011
36	00010101	36	000011010100
37	00010110	37	000011010101
38	00010111	38	000011010110
39	00101000	39	000011010111
40	00101001	40	000001101100
41	00101010	41	000001101101
42	00101011	42	000011011010
43	00101100	43	000011011011
44	00101101	44	000001010100
45	00000100	45	000001010101
46	00000101	46	000001010110
47	00001010	47	000001010111
48	00001011	48	000001100100
49	01010010	49	000001100101
50	01010011	50	000001010010
51	01010100	51	000001010011
52	01010101	52	000000100100
53	00100100	53	000000110111
54	00100101	54	000000111000
55	01011000	55	000000100111
56	01011001	56	000000101000
57	01011010	57	000001011000
58	01011011	58	000001011001
59	01001010	59	000000101011
60	01001011	60	000000101100
61	00110010	61	000001011010
62	00110011	62	000001100110
63	00110100	63	000001100111

TABLE 3/T.6  
Make-up codes between 64 and 1728

White run lengths	Code word	Black run lengths	Code word
64	11011	64	0000001111
128	10010	128	000011001000
192	010111	192	000011001001
256	0110111	256	000001011011
320	00110110	320	000000110011
384	00110111	384	000000110100
448	01100100	448	000000110101
512	01100101	512	000000110110
576	01101000	576	0000001101101
640	01100111	640	0000001001010
704	011001100	704	0000001001011
768	011001101	768	0000001001100
832	011010010	832	0000001001101
896	011010011	896	0000001110010
960	011010100	960	0000001110011
1024	011010101	1024	0000001110100
1088	011010110	1088	0000001110101
1152	011010111	1152	0000001110110
1216	011011000	1216	0000001110111
1280	011011001	1280	0000001010010
1344	011011010	1344	0000001010011
1408	011011011	1408	0000001010100
1472	010011000	1472	0000001010101
1536	010011001	1536	0000001011010
1600	010011010	1600	0000001011011
1664	011000	1664	0000001100100
1728	010011011	1728	0000001100101

Make-up codes between 1792 and 2560

Run length (black and white)	Make-up codes
1792	00000001000
1856	00000001100
1920	00000001101
1984	000000010010
2048	000000010011
2112	000000010100
2176	000000010101
2240	000000010110
2304	000000010111
2368	000000011100
2432	000000011101
2496	000000011110
2560	000000011111



# **STANDARD RASTER FORMATS**

- **Type I - Untiled**
- **Type II - Tiled**

**WESCO 4/26/88**

# **TILED AND UNTILED FEATURES**

- **UNTILED**

- CODED IN CCITT GROUP 4<sup>\*</sup> FORMAT
- LANDSCAPE AND PORTRAIT AXES FIXED
- COMPLETE COMPRESSION/DECOMPRESSION  
REQUIRED

- **TILED**

- CODED IN CCITT GROUP 4<sup>\*</sup> AND BITMAP  
FORMAT
- ORIENTATION AND AXES IDENTIFIED IN THE  
DOCUMENT CONTENT
- FLEXIBLE TILE INDEX
- PRESENTATION AND CONTENT IN  
ACCORDANCE WITH ISO 8613 PART 7,  
8824, AND 8825

<sup>\*</sup> **FED-STD-1065**

**WESCO 4/26/88**

# **BASIC ATTRIBUTES NECESSARY TO SUPPORT RASTER FILE PROCESSING**

- **COMPRESSION CODING SCHEME**
- **RESOLUTION**
  - DEFAULT VALUE 200 PIXELS PER INCH
  - OPTIONS 180, 240, 300, 600, AND 1200  
PIXELS PER INCH
- **ORIENTATION**
  - INITIAL POINT IDENTIFIED
- **SCAN AXES**
  - PEL PATH IDENTIFIED
  - LINE PROGRESSION IDENTIFIED
- **IMAGE SIZE**
  - VERTICAL PIXEL LENGTH
  - HORIZONTAL PIXEL LENGTH
- **TYPE II FORMAT**
  - TILE INDEX
  - TILE DIMENSIONS
  - TILE POSITIONS

**WESCO 4/26/88**

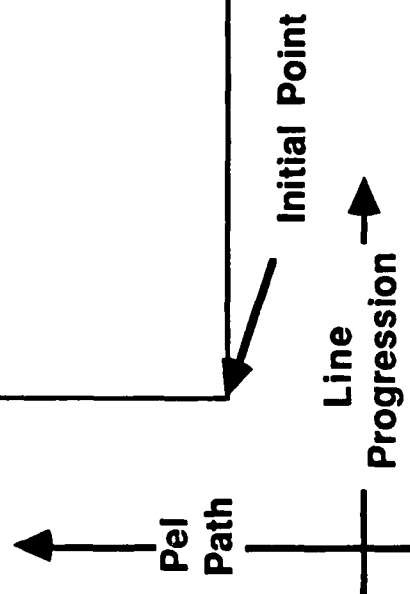
# **RASTER FILE IDENTIFICATION**

- **MIL-STD-1840**
  - DOCUMENT IDENTIFIER INFORMATION (i.e.  
DRAWING NUMBER, SHEET NUMBER,  
REVISION NUMBER ...)
  - BASIC IMAGE INFORMATION
  - COMPRESSION FORMAT
- **MIL-R-RASTER**
  - IMAGE FILE CONTENT INFORMATION (i.e.  
ORIENTATION, RESOLUTION ...)
  - QUALITY AND ACCEPTANCE CRITERIA
  - FILE CODING EXAMPLES FOR TILED FORMATS
  - CCITT GROUP 4 RESTRICTIONS

**WESCO 4/26/88**

UNTILED FORMAT

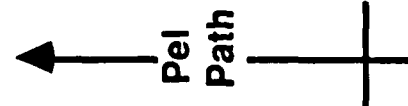
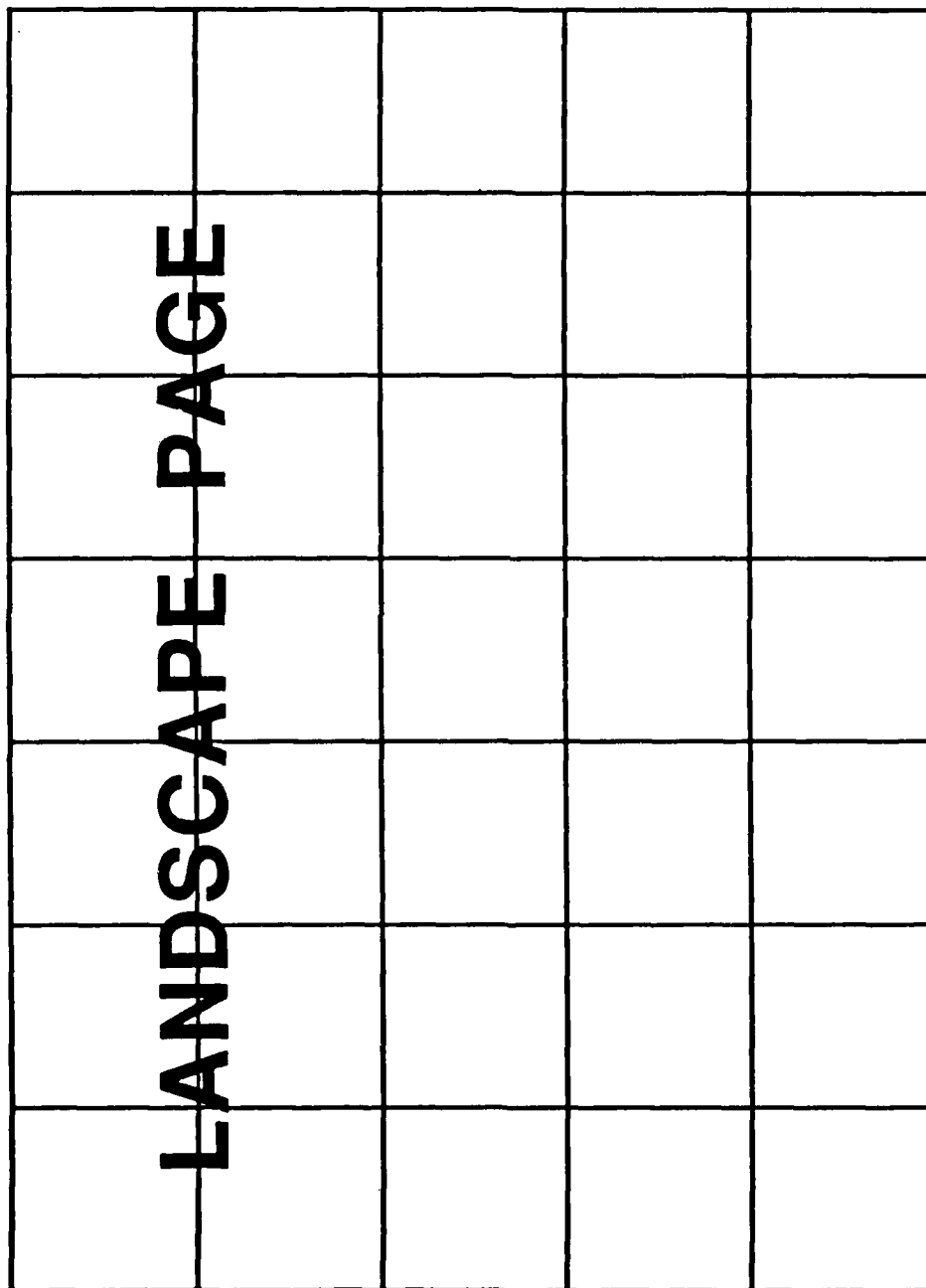
LANDSCAPE PAGE



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# **TILED FORMAT**

## **LANDSCAPE PAGE**



Initial Point

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**BRIEFING -- MIL-D-CGM**

**DIGITAL REPRESENTATION FOR  
COMMUNICATION OF ILLUSTRATION DATA**

**BY**

**DANIEL R. BENIGNI**

**GRAPHICS SOFTWARE GROUP  
NATIONAL BUREAU OF STANDARDS  
TECHNOLOGY BLDG., RM. A266  
GAITHERSBURG, MD 20899  
(301) 975-3266**



# OUTLINE

- BACKGROUND
- WHAT IS CGM
- WHAT IS CGM APPLICATION PROFILE
- MIL-D-CGM
- CONFORMANCE AND APPLICATION TESTING
- FUTURE
- IT WORKS!

## **BACKGROUND '86**

**NBSIR 87-3566 -- FINAL NBS REPORT FOR CALS FY86**

- **WHAT ARE GRAPHICS STANDARDS**
- **REFERENCE MODEL**
- **NBS ROLE**
- **ASSESSMENT OF DoD NEEDS**
- **VALIDATION**
- **COMPATIBILITY OF STANDARDS**

## **BACKGROUND '87**

**NBSIR 88-3726/7/8/9 -- A COLLECTION OF TECHNICAL  
STUDIES COMPLETED FOR THE CALS PROGRAM, FY87**

### **VOLUME 2 AND 3 PERTAIN TO GRAPHICS**

- **RASTER-TO-VECTOR TECHNOLOGY**
- **CGM VALIDATION ROUTINES**
- **IGES TO CGM TRANSLATOR**
- **EXTENDED CGM STANDARDS EFFORT**
- **CGM REGISTRATION**
- **CGM REFERENCE IMPLEMENTATION**
- **CGM APPLICATION PROFILE**

## WHAT IS CGM?

- DATA INTERFACE STANDARD
  - SPECIFIES FILE FORMAT
  - PICTURE INFORMATION
  - DEVICE-INDEPENDENT
- PURPOSE - FACILITATE PICTURE TRANSFER BETWEEN
  - DIFFERENT GRAPHICAL SOFTWARE SYSTEMS
  - DIFFERENT GRAPHICAL DEVICES
  - DIFFERENT COMPUTER GRAPHICS INSTALLATIONS
- WHICH STANDARD:
  - ISO 8632/1-4 1987 (INTERNATIONAL)
  - ANSI X3.122-1986 (NATIONAL)
  - FIPS 128 (FEDERAL GOVERNMENT)

# CGM FEATURES

- FUNCTIONAL SPECIFICATION - SEMANTICS
  - SNAPSHOT OF FINAL IMAGE
  - FILE FORMAT OF ORDERED SET OF ELEMENTS
  - ONE OR MORE PICTURES
  - RANDOM ACCESS -- PICTURE INDEPENDENCE
- 3 ENCODINGS OF METAFILE SEMANTICS - SYNTAX
  - CHARACTER
  - BINARY
  - CLEAR TEXT
- DOES NOT INCLUDE
  - METAFILE GENERATOR SPECIFICATIONS
  - METAFILE INTERPRETER SPECIFICATIONS

## WHY HAVE A CGM APPLICATION PROFILE FOR CGM?

- CGM SYNTAX IS COMPLETE AND UNAMBIGUOUS, BUT  
CGM SEMANTICS ARE INCOMPLETE --

"IMPLEMENTATION DEPENDENT"

- BEHAVIOR OF CGM GENERATORS AND INTERPRETERS  
IS NOT STANDARDIZED

RESULT -- THERE CAN BE NO SINGLE CORRECT  
INTERPRETATION OF A METAFILE  
WITHOUT AN APPLICATION PROFILE

# **WHAT IS AN APPLICATION PROFILE (AP)?**

**IT HAS BEEN DEFINED IN CALS AS:**

**"A DEFINED SET OF SPECIFIC  
ENTITY TYPES WHICH ARE USED  
TO COMPLETELY AND UNAMBIGUOUSLY  
REPRESENT THE INFORMATION  
REQUIREMENTS FOR A PARTICULAR  
APPLICATION OF DIGITAL GRAPHICS  
DATA."**

## **MIL-D-CGM**

- **CGM APPLICATION PROFILE FOR COMMUNICATION OF ILLUSTRATION DATA**
- **RESOLUTION OF AMBIGUOUS SEMANTICS**
- **SPECIFICATION OF BEHAVIOR OF CGM GENERATORS AND INTERPRETERS**
- **ADDITION OF REGISTERED PARAMETER AND ATTRIBUTE VALUES**



## **MIL-D-CGM FEATURES**

- IDENTICAL TO MAP/TOP V3.0 APPLICATION PROFILE WITH:
  - A FEW EXCEPTIONS/DEVIATIONS
  - A FEW ADDITIONS
  - SOME CLARIFICATION/EMPHASIS OF INTENT
- COMPATIBILITY WITH MAP/TOP CGM APPLICATION PROFILE
  - COLLABORATIVE WORK WITH TOP EXPERTS TO MAINTAIN COMPATIBILITY
- OBJECTIVES
  - IMMEDIATELY USABLE
  - SUPERSET OF THE TOP PROFILE
  - IMPLEMENTABLE NOW

# **RELATION OF MIL-D-CGM TO MIL-STD-1840A**

- **WILL OPERATE AS DO MIL-D-28000  
AND MIL-D-28001**
- **UPDATE MIL-STD-1840A TO CALL  
OUT USE OF MIL-D-CGM**

## **CONFORMANCE TESTING**

### **● NATIONAL BUREAU OF STANDARDS**

- KEEP TABS ON WORK IN EUROPE**
- ENCOURAGING TESTING OF VENDOR-SUPPORTED FEATURES**
- ASSESS IMPACT OF TEST DEVELOPMENT STRATEGY ON CALS AND MARKETPLACE**
- SUPPORT THE CALS TEST NETWORK**

# APPLICATION TESTING

## ● DOD CALS TEST NETWORK

— HOW - AS PHASE I.1 STANDARD MIL-D-CGM  
WILL FOLLOW PHASE I.0 STANDARDS  
TESTING

— WHEN - START IN JANUARY '89 TIMEFRAME

— WHAT - FOR TECHNICAL ILLUSTRATIONS.  
STEPS WILL BE SIMILAR TO THOSE  
FOR PHASE I.0 STANDARDS TESTING:

REFERENCE ILLUSTRATION

TEST PLATFORM

INDUSTRY TO TEST PLATFORM

GOVERNMENT TO TEST PLATFORM

GOVERNMENT TO GOVERNMENT

CAD VENDOR TO TEST PLATFORM

VENDOR TO GOVERNMENT

## **FUTURE**

- **MAINTAIN LIAISON WITH MAP/TOP**
  - **COMMON EVOLUTION WHERE POSSIBLE**
- **LOOKING AT SUITABILITY OF OTHER ENCODINGS**
  - **INDUSTRY**
  - **MAP/TOP**
  - **CALS NEEDS**
  - **CLEAR TEXT FOR TESTING?**
- **REPRESENT CALS IN**
  - **EXTENDED CGM STANDARD**
  - **REGISTRATION**
  - **ADDENDUM 3 TO CGM**
- **MIL-D-CGM PUBLICATION**
  - **RESPOND TO YOUR COMMENTS**
  - **RESPOND TO STANDARDS WORK**
  - **RESPOND TO MAP/TOP**

# IT WORKS!

- **INTEGRATE '88 AT NCGA CONFERENCE**
  - **BENEFITS OF SYSTEM INTEGRATION USING CGM**
  - **38 VENDORS EXCHANGED OVER 100 METAFILES**
  - **REAL LIFE SCENARIOS**
  - **USE OF MAP/TOP CGM AP TO ENSURE INTERCHANGE**

## INDUSTRY INVOLVEMENT IN INTEGRATE '88

### ADVANCED TECHNOLOGY CENTER

ALDUS

APOLLO COMPUTER INC.

AUTOCAD

BENSON-SCHLUMBERGER

BRILLIANT IMAGE INC.

CADAM INC.

CALCOMP INC.

COMPUTER ASSOCIATES INTERNATIONAL

CONTROL DATA CORPORATION

DIGITAL EQUIPMENT CORPORATION

EDS

GENIGRAPHIC CORPORATION

GRAFPOINT

HEWLETT-PACKARD COMPANY

KMW SYSTEMS CORPORATION

LOGIC SCIENCES

LOTUS DEVELOPMENT CORPORATION

MAGICORP

MCDONNELL DOUGLAS

MOTOROLA INC.

NOVA GRAPHICS INTL. CORP.

PANSOPHIC SYSTEMS

PRECISION IMAGE CORP.

PRECISION VISUALS CORP.

PRESENTATION TECHNOLOGIES

PRIME COMPUTER INC.

QMS

SOFTWARE PUBLISHING CORP.

SUN MICROSYSTEMS

SYSTEM ONE SOFTWARE INC.

TEKNIGRAPHICS

TEKTRONIX INC.

WANG LABORATORIES INC.

WASATCH COMPUTER TECHNOLOGY

XEROX/VENTURA SOFTWARE

XEROX/VERSATEC

ZENOGRAPHICS

## INDUSTRY SUPPORT

- FOR CGM AND MAP/TOP CGM AP

- QUOTES:

"CGM IS A WORKABLE STANDARD"

"CGM IS GOOD FOR ALL - DANGEROUS TO NONE"

"CGM CAN LEVERAGE INVESTMENTS ALREADY MADE"

- LOTUS ANNOUNCEMENT

- CGM BECOMING VERY POPULAR PICTURE INTERCHANGE MECHANISM





MIL-STD-1840A  
MIL-D-28000  
MIL-M-28001

**David S. Bettwy**  
**Center for Manufacturing Engineering**  
**CALS Project Office**

MIL-STD-1840A -- 22 December 1987

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## AUTOMATED INTERCHANGE OF TECHNICAL INFORMATION

- Transfer of digital data within & between:
  - Services
  - DLA
  - Industry
  - Other Government Agencies
  
- Currently applicable to:
  - ASCII text files
  - Product data definition files
  - Raster image files
  - Graphics files

# MIL-STD-1840A HISTORY

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CALS/NBS

September 1984

AFLC Directorate of Arch & Stds initiates project at LLNL to develop standards for ATI

July 1985

Air Force only conference

October 1985

DoD/Govt/Industry conference

February 1986

2nd DoD/ Govt/ Industry conference (Approx 75 Co's., the Services, DoD, DLA, NBS, and other Gov't. agencies participated in the meetings)

September 1986

Under pressure of acquisition schedules, Air Force releases limited coordination version of MIL-STD-1840

## MIL-STD-1840A HISTORY (Cont.)

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September 1986

DOD assumes responsibility for full coordination of the standard.

April 1987

DOD circulates draft version of MIL-STD-1840A for coordination.

December 1987

MIL-STD-1840A is approved and released.

Ongoing

Air Force establishing a test bed to conduct validation tests of MIL-STD-1840A and other CALS specifications and standards.

# MIL-STD-1840A / DRAFT CHANGE NOTICE 1

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- Corrects typographical errors in "header records," figure 1, and table IV.
- Makes direct references to:
  - MIL-R-RASTER
  - MIL-D-CGM
- Deletes Appendix A (Raster Data Requirements)
- Provides identification of raster file type (I or II) in an existing header record
- Provides the capability to specify "page image" files in raster format

MIL-M-28001 -- 26 February 1988

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MARKUP REQUIREMENTS AND GENERIC STYLE SPECIFICATION  
FOR ELECTRONIC PRINTED OUTPUT AND EXCHANGE OF TEXT

- Draft Output Specification for style & format of printed technical manuals
  - Industry technical review
  - Testing by NBS & CALS test network
  - Review & coordination -- Fall of 1988
- Joint Industry / DOD paperless (pageless) technical manual study
  - Digital data interface specification for CALS Phase I.2
  - Functional requirements for authoring systems and delivery systems





# MIL - D - 28000 AMENDMENT 1

MANAGEMENT BRIEFING  
26 April 1988

Bradford M. Smith  
Bureau of Standards  
CALS Project

# OBJECTIVES OF AMENDMENT 1

- Corrections to Class I Subset from Technical Publications Committee
- Corrections to Class II Subset from Drafting Committee
- New Class IV Subset on NC Manufacturing
- Updates for use of IGES Version 4.0
- Statement of Intent to Move Towards Use of Application Protocols

# Class IV Numerical Control

## Objectives

To Transfer Geometry of Part Being  
Manufactured via NC Machining

To Transfer Tolerances on Part  
Dimensions

To Transfer Material and Other  
Part Specifications

# SOURCES OF INFORMATION

- IGES/PDES Manufacturing Committee
- I E Survey of Industry Usage  
22 Companies  
280 Phone Calls

# I E SURVEY OF NC USAGE

## Companies Contacted

Acu - Carv	Graphic Manufacturing
Applicon	Hughes Aircraft
Brinkman Tool & Die	IBM
ELCAM	Kodak
General Motors	McDonnell Aircraft
General Dynamics	Monitor
	Pratt & Whitney

# REVIEWERS OF AMENDMENT 1

- IGES/PDES Committees
  - Drafting
  - Electrical Applications
  - Manufacturing
  - Technical Publications
- Ad Hoc Group on MIL-D-28000
- CALS - Industry Committees
- DOD Service Representatives

## **MIL-D-28000 Amendment 1 Project**

### **14 April 1988**

**The CALS Digital Product Data project at the National Bureau of Standards has recently completed an Amendment 1 to MIL-D-28000. The Amendment was prepared as a March 88 deliverable to the DOD CALS Project.**

**The amendment introduces five changes to the MILSPEC:**

- 1. Corrections to Class I data from technical review by the IGES/PDES Technical Publications Committee.**
- 2. Corrections to Class II data from technical review by the IGES/PDES Drafting Committee.**
- 3. Updating of the MILSPEC to use IGES Version 4.0 entity extensions for intercharacter spacing and dotted line font.**
- 4. Addition of a new Class IV section for NC manufacturing data exchange.**
- 5. Wording in Section 6 to introduce the intent to migrate towards Application Protocols with future revisions of the MILSPEC.**

**The Amendment was duplicated and mailed for preliminary review the week of April 4 to IGES/PDES Organization committee chairmen and to members of the CALS Industry Committee. This will start a review and comment effort leading to publication in October 1988.**

1000 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



# **CALS**

## **Program Implementation**

### **Guide**

**MIL — HDBK — CALS**

**8 3812**

# **Publication Schedule**

**April 26**

**General Release**

**June — Aug**

**Consolidation and Review of  
Comments**

- **Services, DLA**
- **Industry Task Force**
- **Industry Associations**

**Sept — Oct**

**Resolution of Comments**

**December**

**Publication**

8-3812

# **MIL — HDBK — CALS Background**

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## **Prior Reviews**

- **April 87 — Phase 1.0 Core Requirements Package**
- **Nov 87 — Preliminary Draft, MIL-HDBK-CALS**
- **Jan 88 — Revised Draft**
- **Apr 88 — Joint Industry/DOD Planning Review**

8-3812

# **MIL — HDBK — CALS**

## **Contents**

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- I-III. Scope, References, Definitions**
- IV. General Guidance**
- V. Detailed Guidance**

### **Appendices**

- A. CALS Overview**
- B. Digital Data Acquisition**
- C. Contractor Process Integration**
- D. Digital Data Delivery/Access Modes**
- E. Security, Data Rights, and Related Issues**

8-3812

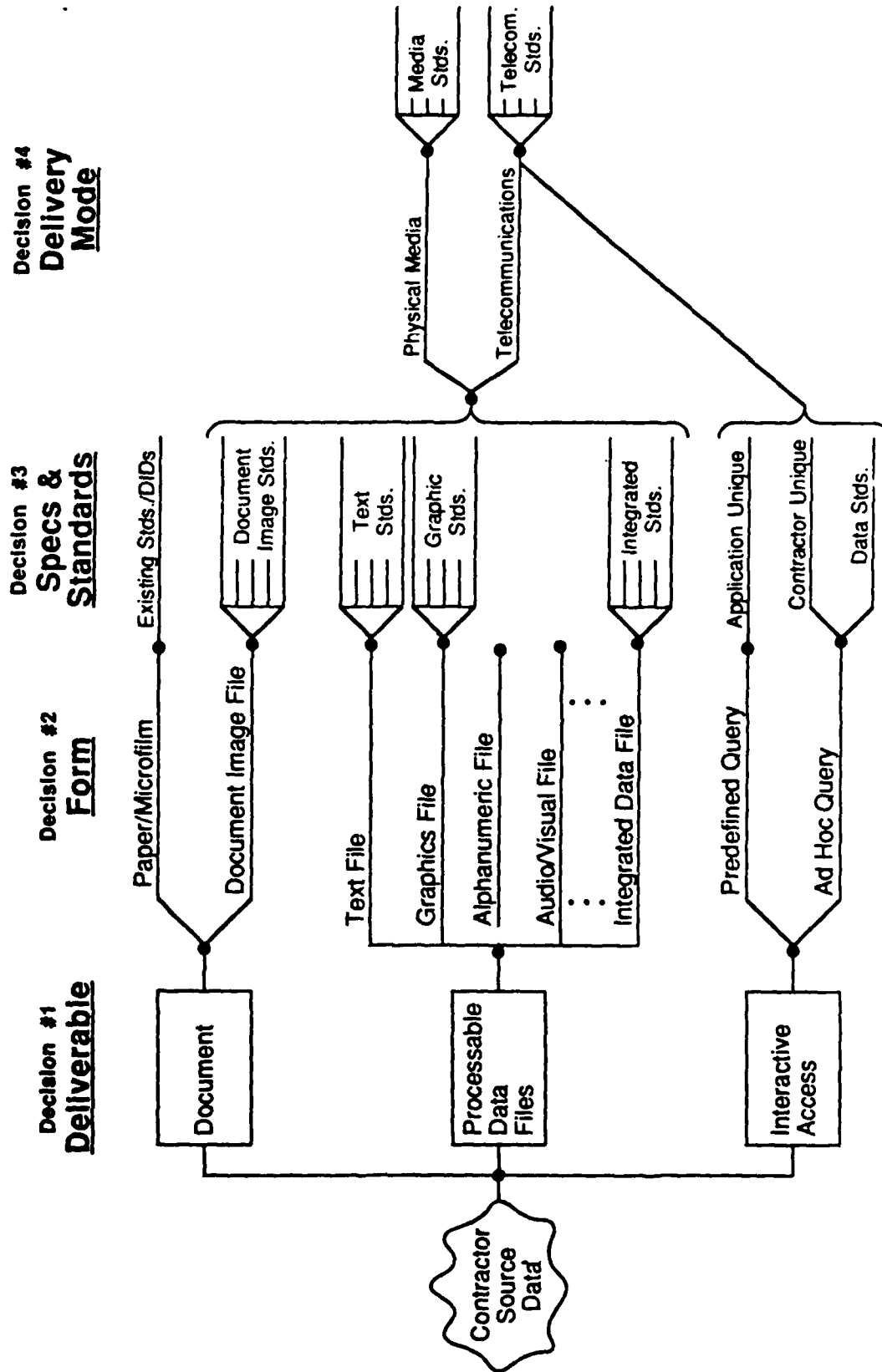
# **CALS Integrated, Shared Data Environment**

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- **Contractor Proposals and Plans to Generate Digital Data from Integrated Information Systems and Shared Data Environment**
- **Digital Data Delivery and Access**
- **Distinguish Between —**
  - **Working Data**
  - **Submitted Data**
  - **Approved Data**
- **Integration of Functions and Processes to Improve Weapon System Reliability and Maintainability**

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# DECISION TEMPLATE FOR ACQUISITION OF DIGITAL DELIVERABLES



## **Appendix B**

# **Digital Data Acquisition**

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- **Technical Manuals**
- **Technical Data Packages**
  - **Engineering Drawings**
  - **Specifications and Book Form Drawings**
- **Logistic Support Analysis Record Data**
- **Training Materials**

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# **Appendix C**

## **Contractor Process Integration Requirements**

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- **R&M Integration with CAD/CAE**
  - Based on Industry/DOD Study of Requirements for Electronics Components
  - Study Beginning for Mechanical Components
- **Instructions to Offerors, Contractor Proposals, Source Selection Criteria**
- **Require Contractor Use of the Proposal After Government Approval**
- **Sample Language for RFP's**

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# **Appendix C**

## **Contractor Process Integration Requirements**

---

- **Instructions to Offerors**
  - **Identify Capability and Experience in Use of Automated R&M Functions**
  - **Explain the Extent to Which R&M Design Tasks are Integrated with CAE Systems**
  - **Describe How These Techniques, Processes, and Data Bases Will be Used to Satisfy RFP Requirements**
- **Structure Source Selection Criteria to Emphasize These Three Areas**
- **Require Contractor to Use the Approach Proposed After Approval by the Government**

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## **Appendix D**

# **Digital Data Delivery and Access**

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- **Physical Media (Magnetic Tape)**
- **Telecommunications Access**
  - **Defense Data Network Compatibility**
  - **Open System Interconnection Compatibility (GOSIP)**

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## **Appendix E**

# **Security, Data Rights and Related Issues**

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- **Management Issues Under Study by the CALS Industry Task Force**
  - **Security Task Group**
  - **Acquisition Task Group**
- **Technology Issues Under Study by the CALS Industry Task Force**
  - **Digital Information Exchange Task Group**

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# **Industry — DOD Review Issues**

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- **Contracting, Access, and Liability**
- **CALS Application for Subcontractors**
- **Data Base Transfer to Government**
- **CALS Application for Government Data Systems**
- **Data Item Description Requirements for Digital Data (Appendix B)**
- **Contractor Process Integration Requirements by Life Cycle Phase (Appendix C)**
- **Delivery/Access Modes (Appendix D)**
- **Definition of Security Requirements (Appendix E)**
- **Digital Data Change Management and Configuration Control (Appendix E)**

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# **Notional Target System For Electronics**

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- **Computer Aids to Develop and Allocate High Level Requirements**
- **Conceptual Design Computer Aids to Assist in Making Architecture and Physical Implementation Trades**
- **Tailored Detail Design Rules to Assist Electronic and Mechanical Designers**
- **Design Estimators**
- **On-Line Validated Databases with Material, Device, and Circuit Characteristics Needed for R&M Design Decision Support**
- **Computer-Aided Design Analyses (Simulators)**
- **Computer-Aided R&M Modeling and Prediction**
- **Computer-Aided Manufacturing with Feedback**
- **Computer-Aided Maintenance with Feedback**

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# Key Conclusions

## The Issue

**CAE Functional Support for Design Decisions That Substantially Determine a Product's R&M**

## The Approach

- R&M CAE Tools are Important But Not Central
- Integration, Validation of Design Decision Support are Key
- Processes and Organizations to Support R&M CAE are Also Key
- R&M CAE Must Fit in Each Contractors Design Processes; Flexibility is Needed in DOD Approach
- DOD and Contractors Must Address Whole Design Process — Both Conceptual Design and Detailed Design
- Emphasis Must Be Put on Improving Design Processes, Not Just the Product

8-3812



# COMPUTER AIDED ACQUISITION AND LOGISTIC SUPPORT (CALS)

H. B. STORMFELTZ

APRIL 1988



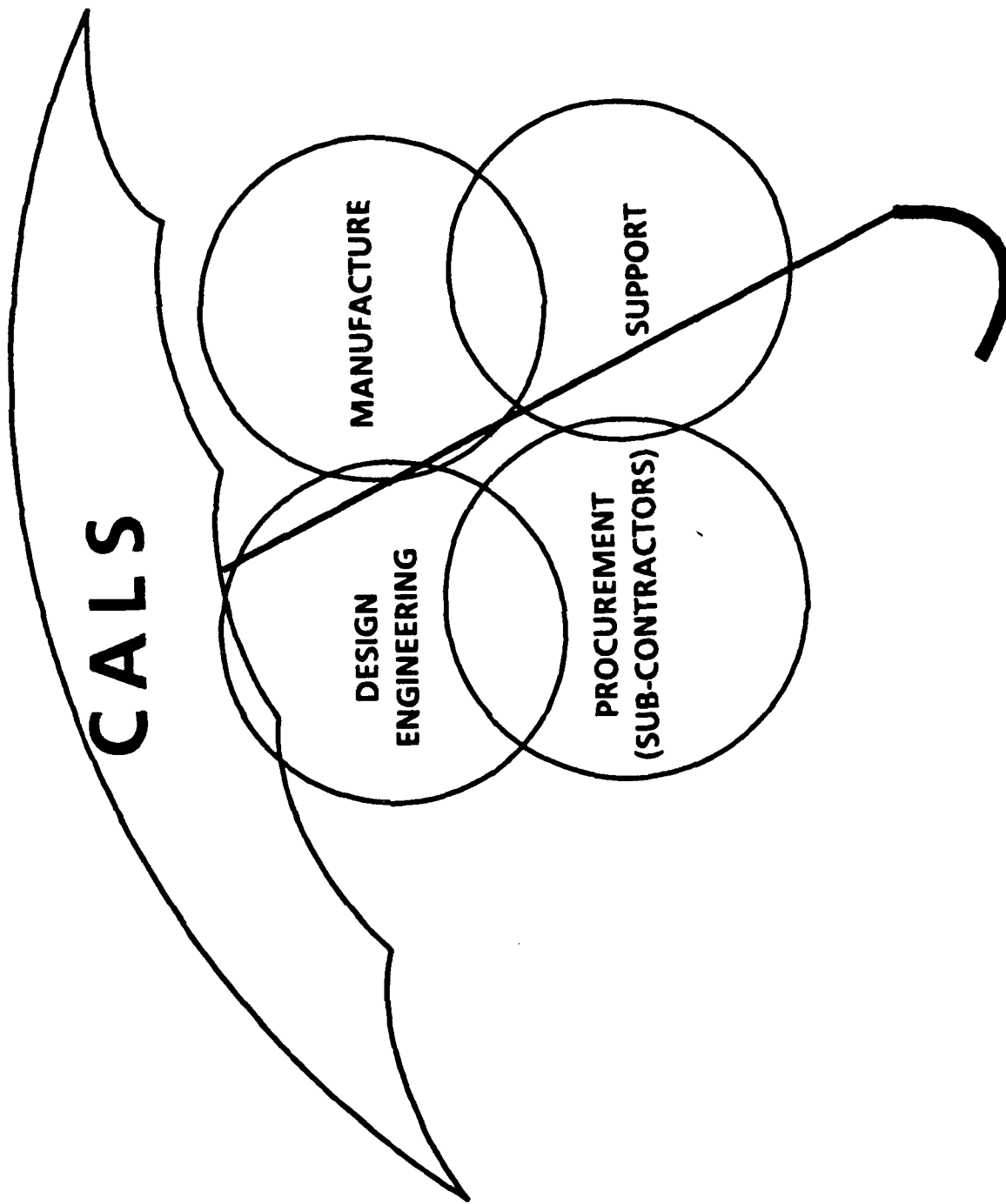
# CALS UNIVERSE DEFINITION

"GENERATION, ACCESS, MANAGEMENT, DISTRIBUTION AND USE OF TECHNICAL DATA IN DIGITAL FORM FOR THE ACQUISITION, DESIGN, MANUFACTURE AND SUPPORT OF WEAPON SYSTEMS, SHIPS AND EQUIPMENT."

CALS IS A STRATEGY FOR INTEGRATION  
NOT A LOGISTIC ADP MANAGEMENT IMPROVEMENT  
PROGRAM

# INTEGRATION

## CALS



## **(ISG) 1987 ACCOMPLISHMENTS**

- ASSISTED DOD IN THE REVIEW OF CORE I STANDARDS.
- PROVIDED INPUTS TO "IMPLEMENTATION GUIDE FOR WEAPON SYSTEMS ACQUISITION."
- PROVIDED AN IN-DEPTH REVIEW OF ORIGINAL GUIDE DRAFT EARLY '87 AND SUBSEQUENT REVIEWS OF UPDATED DRAFTS NOV-DEC '87, APR '88.
- PROMOTED CALS STRATEGY THROUGHOUT INDUSTRY.

**INDUSTRY MANHOURS 75 MAN YEARS**

## **PRIORITIES**

- PAPERLESS TECHNICAL PUBLICATIONS
- SPARES ACQUISITION
- TRAINING MATERIALS / TECHNICAL PUBLICATIONS RELATIONSHIP
- DESIGN INTEGRATION / CONCURRENT DESIGN / PARALLEL RELEASE
- BENEFITS
- ACQUISITION STRATEGIES
- DATA DICTIONARY
- INTEGRATED SUPPORT DATA BASE
- EDUCATION / PUBLIC COMMUNICATIONS
- 1988 YEAR END CONFERENCE

## CALS ISG 1988 ACTIVITIES

### TECH PUBS

- DRAFT TWO SPECIFICATIONS (AUTHOR AND INTERFACE) FOR PAPERLESS PUBLICATIONS AND UNDERSTAND USER REQUIREMENTS.

### SPARES ACQUISITION

- UNDERSTAND THE PROCESS IN THE DIGITAL ENVIRONMENT, RECOMMEND APPLICATIONS AND INTERFACE STANDARDS.

### TRAINING

- PROMOTE CLOSER RELATIONSHIP BETWEEN TRAINING MATERIALS AND TECHNICAL PUBLICATIONS, DURING DATA DEVELOPMENT AND FOR DELIVERY OF TRAINING MATERIAL. RECOMMEND CONCEPTS, STANDARDS AND SPECS.

### DESIGN INTEGRATION

- ENCOURAGE MORE PARTICIPATION FROM ENGINEERING DESIGN COMMUNITY. CONDUCT WORKSHOPS TO DEVELOP DATA FOR CORE DOCUMENTATION.

## CALS ISG 1988 ACTIVITIES (CONTINUED)

# EDUCATION

PROMOTE THE CALS INITIATIVE IN COLLEGES AND UNIVERSITIES INCLUDING DSMC. DEVELOP AN ACTION PLAN AND RECOMMEND CONCEPTS.

## COMMUNICATIONS (PR) -

DEVELOP A PLAN FOR A CALS '88 CONFERENCE IN OCT IN COOPERATION WITH DOD. IMPLEMENT PLAN AND ASSIST NBS IN ORGANIZING THE CONFERENCE. ENCOURAGE INVOLVEMENT FROM SMALL BUSINESSES.

# INTERNATIONAL

## ASSESS THE INTERNATIONAL IMPLICATIONS AND ISSUES ASSOCIATED WITH FMS AND CO-PRODUCTION. DEVELOP AN ACTION PLAN.

## ACQUISITION

**IDENTIFY ISSUES ASSOCIATED WITH THE ACQUISITION PROCESS AND RECOMMEND INPUTS TO THE IMPLEMENTATION GUIDE. EMPHASIZE, CONTRACTING, LEGAL, AND BENEFITS.**

## **CALS ISG 1988 ACTIVITIES (CONTINUED)**

### **SECURITY**

- CONTINUE TO IDENTIFY THE SECURITY ISSUES AND MAKE RECOMMENDATIONS TO THE IMPLEMENTATION GUIDE. PROVIDE LIAISON TO THE OTHER INDUSTRY GROUP - WORKING COMMITTEES.

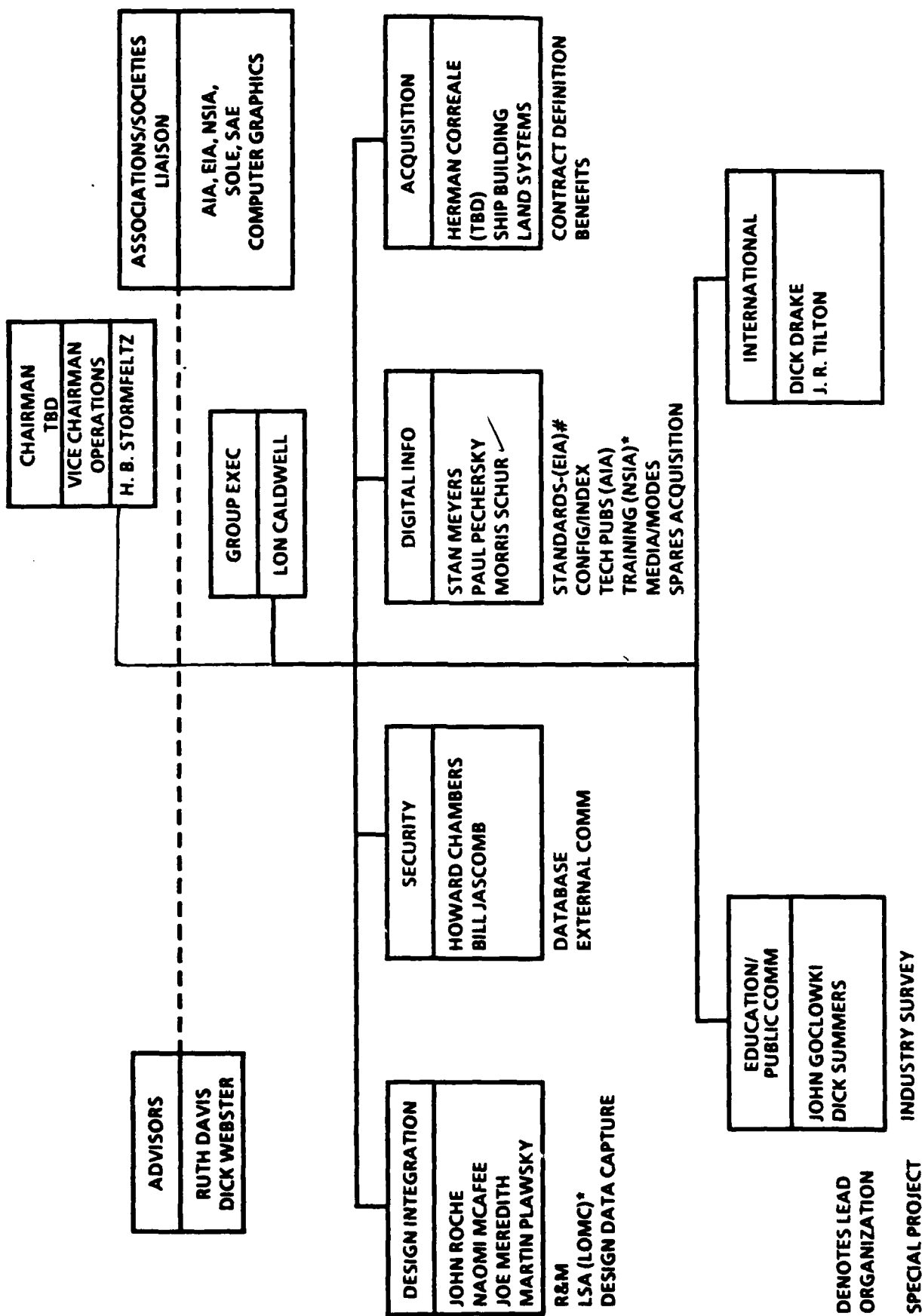
### **STANDARDS**

- CONTINUE TO REVIEW REQUIRED STANDARDS AND SPECS WITH EMPHASIS IN ELECTRONIC INDUSTRY. DEVELOP RATIONALE FOR CHOOSING AMONG COMPETING STANDARDS FOR PRODUCT EXCHANGE FOR ELECTRICAL AND ELECTRONIC APPLICATIONS.

### **BENEFITS**

- COMPILE EXAMPLES OF REALIZED BENEFITS, CONDUCT CONFERENCE MAY 1988.

# INDUSTRY STEERING GROUP (ISG)



\* DENOTES LEAD ORGANIZATION

# SPECIAL PROJECT



# CALS ISG ACTIVITIES

DESIGN  
INTEGRATION TASK  
GROUP

JOHN ROCHE  
NAOMI MCAFEE  
MARTIN PLAWSKY  
JOE MEREDITH

RUSS VAN DE STEED  
(LSA)

1987

## OBJECTIVE

WORKSHOP R&M INTEGRATION WITH DESIGN

## TASKS

- ADDRESS DESIGN/R/M CONCURRENT ANALYSIS
- ASSESS CURRENT CAE/RAMCAD CAPABILITY
- REVIEW R&M DESIGN PROCEDURES AND FACTORS

## RECOMMEND

- USE CALS ACTIVITIES IN SCORING IRAD
  - CREDIT IN PROPOSALS
  - INCREASE IRAD FUNDING
  - LAGGING, EDUCATION AND TRAINING NEEDED
- COULD BE MORE PRODUCTIVE:
- DEVELOP R&M PROCESS STDS
  - NEED INCENTIVES
  - ACCELERATE DEVELOPMENT OF TOOLS (INVESTMENT)
  - ESTABLISH DOD CALS TESTBED FOR CALIBRATION AND INTEGRATION OF R&M TOOLS

# CALS ISG ACTIVITIES (CONTINUED)

1988

- ENCOURAGE MORE PARTICIPATION FROM ENGINEERING DESIGN COMMUNITY.
- CONDUCT WORKSHOPS TO DEVELOP DATA FOR CORE DOCUMENTATION.
  - R&M/CAE INTEGRATION FOR HYDRO-MECH SYSTEMS STUDY THIS YEAR SIMILAR TO THE 1988 ELECTRONICS PROJECT.
- LSA WORKING GROUP WILL CONDUCT A SERIES OF MEETINGS TO ADDRESS LSA/R&M INTEGRATION ACTIVITIES.

# CALS ISG ACTIVITIES (CONTINUED)

SECURITY  
TASK GROUP

HOWARD CHAMBERS  
WILLIAM JASCOMB

HARRY BREWER

1987

TASK

- PRODUCE DATA FOR IMPLEMENTATION HANDBOOK AND SURFACE ISSUES

RECOMMEND

MOST TECHNOLOGIES / STDS EXIST (E.G., NSA RAINBOW SERIES) FOR PHASE I. SUBSEQUENT PHASES REQUIRE INCREASED ATTENTION.  
(BROADER USER BASE AND INCREASED INTEGRATION)

- CONTINUING REVIEW OF EMERGING STANDARDS AND SPECIFICATIONS AS THEY RELATE TO COMPUTER SYSTEMS SECURITY

DOD-WIDE UNIFORM STANDARDS, SPECIFICATIONS, PROCEDURES AND LEGAL POLICIES WILL BE REQUIRED TO ASSURE CONTRACTOR PROTECTION.

1988

PLANNING

- SPRING - REVIEW - SGML AND OFFICE DOCUMENT INTERFACE FORMAT (ODA/ODIF)  
MAY 11-12 STANDARDS
- SUMMER - REVIEW - IGES, INITIAL GRAPHICS EXCHANGES STANDARD CGM, COMPUTER GRAPHICS METAFILE PDES. PRODUCT DESCRIPTION EXCHANGE SPECIFICATION

## CALS ISG ACTIVITIES (CONT'D)

## DIGITAL INFORMATION INTERCHANGE TASK GROUP

**STAN MEYERS**  
**PAUL PECHERSKY**

**STDS** - **JOHN ANDERSON**  
**CONFIG** - **KEN CALDWELL**  
**SPARES PROC.** - **SANDY BOROWY**  
**TRAINING** - **BOB PIERPONT**  
**TECH PUBS** - **BILL MIDDLETON**  
**INFOR TECH** - **BOB KIDWELL**

1987

- COORDINATED WITH DOD ON ALL STANDARDS REVIEWS AND RECOMMENDATIONS
- FOCAL POINT FOR REVIEW OF CALS HANDBOOK DRAFTS
- PERFORMED PRELIMINARY REVIEW OF LOGISTICS DATA INDEXING (LDI) CONCEPT
- FORMED "SOFTWARE" AD HOC WORKING GROUP
- DEVELOPED TECH DATA STRUCTURE (PRELIMINARY) FOR SPARES PROCUREMENT
- ESTABLISHED TRAINING (NSIA) AND TECH MANUAL (AIA) WORKING GROUPS
- KICKED-OFF ACTIVITY TO DEVELOP PAPERLESS TECH ORDER SPECIFICATIONS

1988

- CONTINUE TO REVIEW INDEXING SCHEMES AND ESTABLISH CATALOG. FINALIZE REPORT ON (LDI) CONCEPT
- ASSIST AND COORDINATE WITH DOD/NBS FOR STANDARDS REVIEW - NEXT UP DATE OCT 88?

# CALS ISG ACTIVITIES (CONT'D)

## DIGITAL INFORMATION INTER- CHANGE TASK GROUP (CONT'D)

1988

- CONTINUE TO REVIEW INDEXING SCHEMES AND ESTABLISH CATALOG. FINALIZE REPORT ON (LDI) CONCEPT
- ASSIST AND COORDINATE WITH DOD/NBS FOR STANDARDS REVIEW - NEXT UP DATE OCT 88?
- TECHNICAL PUBLICATIONS (AUTHORING - DELIVERY)  
CONCEPT PAPERS JULY 1988  
PRELIMINARY DRAFTS OCT 88  
UPDATED STRAWMAN DEC 88
- STRUCTURE SPARES ACQUISITION PROCESS IN DIGITAL ENVIRONMENT DEC 88 - JAN 89
- DEFINE COMMON ELEMENTS BETWEEN TRAINING AND TECHNICAL PUBLICATIONS MID 88
- DEVELOP TRAINING ACTIVITY FUNCTIONAL FLOW BY LIFE CYCLE PHASES OCT 88
- DEVELOP CONFIGURATION MANAGEMENT FUNCTIONAL SPEC  
DRAFT OUTLINE JUNE 88  
STRAWMAN OCT 88
- DEVELOP TELECOMMUNICATIONS TECHNOLOGY FORECAST AND ATTRIBUTE MATRIX DEC 88 - JAN 89

FULL TASK GROUP MEETING AT NBS JUNE 14-15-16

**INTERNATIONAL  
TASK GROUP**

**DICK DRAKE**  
**J.R. TILTON**

## FORMED TASK GROUP

## PARTICIPATE IN INTERNATIONAL SYMPOSIUMS

## DEVELOP LIST OF ISSUES (SEPT 88)

**DEVELOP INPUT FOR NEXT RELEASE OF CALS HANDBOOK (OCT 88)**

# CALS ISG ACTIVITIES (CONT'D)

ACQUISITION TASK  
GROUP

HERMAN CORREALE  
(TBD) SHIP BUILDER  
(TBD) ARMY LAND <sup>SYS</sup>

BENEFITS - DICK RICHARDS - DICK POWELL  
CONTRACTS - TOM ROBERTS - JIM MCCANN

1987

STARTED ACTIVITY TO IDENTIFY COST BENEFITS  
INITIATED FORMULATION OF ACQUISITION GROUP

1988

IDENTIFY EXAMPLES OF BENEFITS FROM IMPLEMENTATION THE CALS STRATEGY  
DEFINE ISSUES ASSOCIATED WITH CONTRACTING  
DEVELOP ACQUISITION STRATEGY OPTIONS  
EXPLORE LEGAL RAMIFICATIONS

## CALS ISG ACTIVITIES (CONT'D)

## EDUCATION/COMMUNICATIONS TASK GROUP

**JOHN GOCLOWSKI**  
**DICK SUMMERS**

1987

**INDUSTRY SURVEY • DETERMINE BASELINE OF COMPUTER AIDED TECHNOLOGY CAPABILITIES IN PRODUCTION USE NOW**

**SENT TO 40 TOP-DOD CONTRACTORS (BY DOLLAR VOLUMN)  
- 75% RESPONDED -**

(MORRIS SHUR & BOB STRAIN ASSISTED DICK SUMMERS)

1988

# COMPLETED INDUSTRY SURVEY REPORT

## JUNE 15TH - CONDUCT SESSION WITH RESPONSES TO REVIEW RESULTS OF SURVEY

**ASSIST DOD IN PLANNING CALS CONFERENCE OCT 4-5-6 AT NBS**

**INTERFACE WITH DSMC (DEFENSE SYSTEMS MGMT COLLEGE) AND ASSIST AS APPROPRIATE IN DEVELOPING CALS PROGRAM MANAGEMENT COURSE.**



## CALS CORE PACKAGE REVIEW ACTION LIST APRIL 12, 1988

ACTION ITEM	ASSIGNEE	DATE
PARA 4.3.3 GUIDANCE FOR SUBCONTRACTING ISSUES: DIRECTED SUBS, CONFLICTS PRIME / SUBS, SUPPLIERS, ETC.	ACQUISITION GROUP HERM CORREALE	8/88 DRAFT
PARA 4.3.X NON-DEVELOPMENTAL ITEMS (NDI) ISSUES: APPLICATION OF STANDARDS, INTEGRATION WITH PRIME INFO, ETC.	ACQUISITION GROUP HERM CORREALE	8/88 DRAFT
PARA 4.3.2 GOVERNMENT-FURNISHED INFORMATION (GFI) ISSUES: STRUCTURE OF INFORMATION, FORMAT, INTEGRATION, TRANSLATION, FEEDBACK, ETC.	DIGITAL INFO GROUP PAUL PECHERSKY (TECHNICAL ISSUES) ACQUISITION GROUP HERM CORREALE (CONTRACT ISSUES)	8/88 DRAFT

# **CALS CORE PACKAGE REVIEW ACTION LIST APRIL 12, 1988 (cont.)**

ACTION ITEM	ASSIGNEE	DATE
<b>PARA 3.4.3 INFORMATION CATEGORIES ISSUES: PROVIDE DEFINIT. IN FOUR CATEGORIES (ENG., MANUFACTURING, LOGISTICS, MANAGEMENT)</b>	<b>INFO INTEG. GROUP CAROL TIERNEY</b>	<b>6/88 PRELIM. 10/88 INTERIM</b>
<b>APPENDIX C R&amp;M ISSUES: ADDRESS LIFE CYCLE DURING MECHANICAL STUDY</b>	<b>DESIGN INTEG GROUP JOHN ROCHE</b>	<b>10/88</b>
<b>APPENDIX D ISSUES: REWRITE ENTIRE APPENDIX</b>	<b>INFO TECH GROUP BOB KIDWELL</b>	<b>10/88 DRAFT</b>
<b>APPENDIX E ISSUES: REWRITE APPENDIX TO CLARIFY ISSUES &amp; IDENTIFY COGNIZANT SERVICE SECURITY OFF.</b>	<b>SECURITY HOWARD CHAMBERS</b>	<b>6/88</b>

# **CALS CORE PACKAGE REVIEW ACTION LIST APRIL 12, 1988 (cont.)**

ACTION ITEM	ASSIGNEE	DATE
STANDARDS ISSUES: ALL NEW STANDARDS	STANDARDS GROUP GEORGE JENKINS	6/88 INIT. REV. 9/88 2ND REV.
PARA 4.3.1 CONTRACT DATA REQUIREMENTS ISSUES: DEFINE HOW TO AMEND DIDs FOR DIGITAL TRANSFER	OSD - DDMO CARL BERRY	6/88
GUIDANCE ON DOD ITIS SYSTEMS	OSD POLICY OFFICE MIKE McGRATH	10/88 DRAFT

# CALS CORE PACKAGE REVIEW ACTION LIST APRIL 12, 1988 (cont.)

ACTION ITEM	ASSIGNEE	DATE
<p>PARA 4.5 CONFIGURATION MANAGEMENT ISSUES: APPLICATION BY CONTRACTOR, TRANSITION TO GOVERNMENT, ETC.</p>	<p>CONFIG. MAN. GROUP KEN CALDWELL</p>	<p>6/88 DRAFT FUNCTIONAL SPECIFICATION DRAFT 10/88</p>
<p>PARA 5.2.X DATA BASE TRANSITION TO GOVERNMENT ISSUES: PROCEDURES FOR HANDOFF</p>	<p>INFO TECH GROUP BOB KIDWELL</p>	<p>8/88 DRAFT</p>
<p>DEFINITIONS (INTEGRATED TECHNICAL INFO SYSTEM (ITIS - CONTRACTOR (C) / GOVT(G), CALS INTEGRATED WEAPON SYSTEM DATA BASE (CIWSDB)).</p>	<p>INFO TECH GROUP STAN MEYERS/ BOB KIDWELL</p>	<p>6/88</p>

## **SUMMARY**

- **USE CALS ACTIVITIES IN IRAD SCORING**
- **ACCELERATE AND INCREASE R&D FUNDING FOR R&M TOOLS INTEGRATION**
- **PROVIDE CREDIT IN PROGRAM PROPOSAL EVALUATIONS**
- **DEVELOP R&M PROCESS STANDARDS**
- **INCREASE ATTENTION TO SECURITY**

## SUMMARY

- INDUSTRY IS COMMITTED TO ACHIEVING MAJOR GAINS THROUGH AUTOMATION
- INDUSTRY IS IMPLEMENTING SYSTEMS TO SATISFY CALS STRATEGY 77% OF SURVEY RESPONDEES HAVE DIGITAL INTERFACES ESTABLISHED
- WILL REQUIRE CONCERTED PLANNING AND INVESTMENT BY BOTH INDUSTRY AND DOD
- BOTH INDUSTRY AND DOD MUST ACCELERATE IN-HOUSE TRAINING/INDOCTRINATION PROGRAMS TO MEET 1990 IMPLEMENTATION GOALS
- NEED MASTERPLAN/ROADMAP TO MEET GOALS
- NEED MORE POLICY LEVEL MEETS BETWEEN THE STEERING GROUPS (MIN QTRLY, SPECIFIC AGENDAS)

VERY GOOD RELATIONSHIP WITH DOD



# PDES, Inc.

W.B. Rigdon

MDA88-197



## PDES, Inc. Objectives

- Establish A Definition Of Information Constituting A Computer Interpretable Definition Of A Product
- Gain Acceptance Of The Information Definition In A Usable Standard Information Specification
- Accelerate Implementation Of Technologies Pertinent To The Delivery And Interpretation Of Such Product Definition Information In Heterogeneous Computer Environments
- Meet DoD Request For Accelerated Development And Implementation For Early 1990's Availability
- Work With NBS And The ANSI And ISO Standards Organizations To Establish A PDES Specification By The End Of 1990 That Is Acceptable To Much Of U.S. Industry And The International Community

MDA88-198

# PDES Development Plan

## Deliverables

- Version 1.0 (18 Months):
  - Specification Including Information Models For Product Data For Mechanical Parts And Rigid Assemblies--Verified And Demonstrated
  - Software For Use In Creating The Models For Implementing Product Data Exchange Systems
- Version 2.0--Preliminary (6 Months):
  - Add Electrical/Hydraulic Information
  - Extend From Engineering To Manufacturing And Logistics
- Version 3.0--Preliminary (12 Months):
  - Complete Configuration Data
  - Incorporate Database Management System Requirements

Project Completes In 3 Years  
Unless Extended By Mutual Agreement

MDA88-199

# Organization And Management

- Industry Will Assume The Leadership Role, Working In Conjunction With NBS And DoD
- Form Corporation--PDES, Inc.--To Hire "Host Contractor" For Project Management
- 3 Year Membership Open To Any Company Or Educational Institution
  - Class 1: \$100K Dues + 2 Man-Years Technical Effort Each Year
  - Class 2: \$100K Dues + 1 Man-Year Technical Effort Each Year
  - Class 3: \$25K Dues
  - Government Associate: Dues + Technical Participation As Appropriate
- Membership Rights:
  - Class 1: Voting Stockholder/Executive Board/Participation/Data Rights
  - Class 2: Participation/Data Rights
  - Class 3: Observer/No Data Rights
  - Government Associate: Participation
- Executive Board Is Final Authority
- Host Contractor Responsible For Day-To-Day Project Control
  - General Manager And Staff
  - Member Furnished Technical Staff
  - Minimal Co-Location

MDA88-200

# Reason For Joining

- Leverage Development Of PDES Technology
- Respond To DoD Initiative With Industry Leadership
- Influence DoD CALS Expectations
- Establish Acceptable Standards vs. Imposed Standards
- Reduce Product Life Cycle Cost
- Obtain Proprietary Data Rights To Software Implementation

MDA88-201

# Status

- Minimum Start-Up Threshold-6 Class 1 Members  
(Version 1 Only)
- Incorporation In Process
- Optimum Membership-20 Class 1 Members  
(Full Specifications)
- Host Contractor Selection Process Begun

MDA88-202

# PDES Members

- Boeing
- General Electric
- General Dynamics
- Grumman
- Lockheed
- McDonnell Douglas

MDA88-203



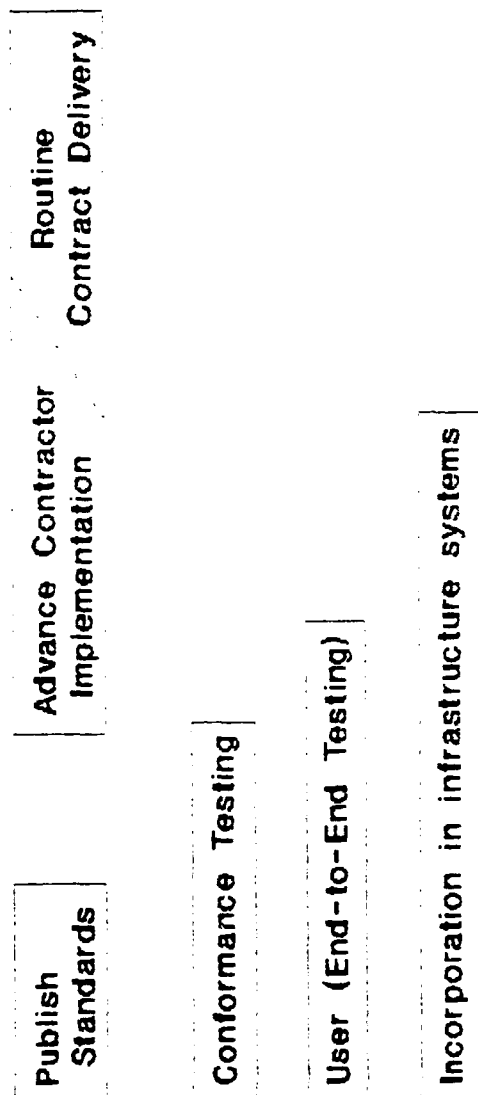
Update on Progress:

## CALS TESTING NETWORK

Melvin S. Lammers  
HQ AFLC/SCTA  
April 19, 1988



# IMPLEMENTATION STEPS



19 April 1988

## CTN ATTRIBUTES

- Focus on User Testing
  - Structured Experiments
  - Naturally Occurring Experiments
- Demonstrate Effectiveness and Benefits
- Communication Network and Data Base
- Feedback to Standards Process and Vendor Implementations

19 April 1988

## DISTRIBUTED TESTS

- AFLC/LLNL Lead in Planning, Coordinating, and Networking
- Participation by Services, Industry and Other Agencies

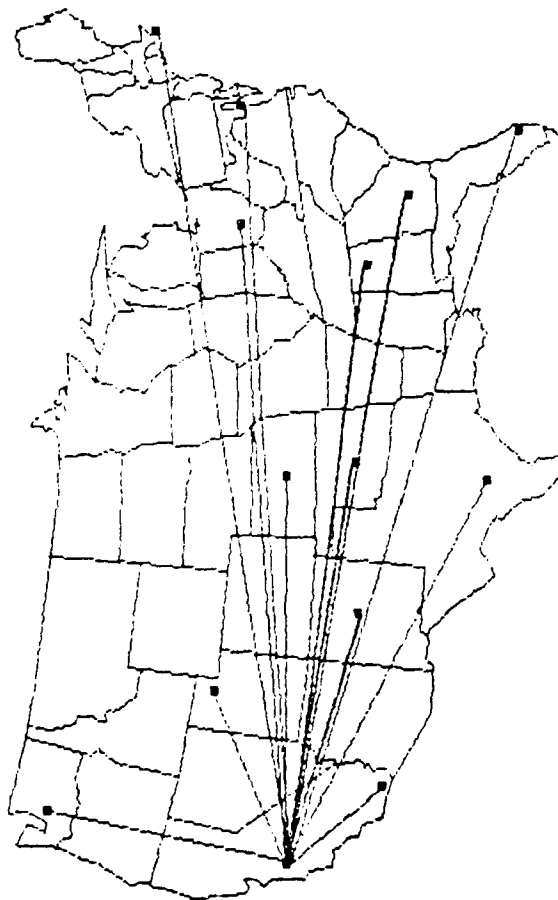
19 April 1988

# Logical Network

- Some Telecommunications
  - ARPANET
  - Dialup
- Mag Tape
- Optical Disk

19 April 1988

## CTN Network



## Memo of Agreement

- With LLNL and AFLC
- Industry Members
- Government Members
- Mutual Benefit

19 April 1988

## Test Results

- LLNL Publishes and Distributes
- On-line Data Base
- Mailing List

19 April 1988

# Database System

- Dialup
- ARPANET
- Test Results
- New Information
- Messages
- Test Data (Download)

19 April 1988



# Testing

- First Reports Being Distributed
- Represents Prior Work
- Mailing List Needs Updating

19 April 1988

## Corrective Action Review Board (CARB)

- Evaluate Test Results
- Propose and Monitor Corrective Action
- Distribute Test Results
- Report on CTN Progress
- Chaired by CTN Manager
- Members: OSD, Services, NBS, LLNL, Other Govt. Agencies, Industry CALS Task Force

19 April 1988

# CALS Test Network

## Questions and Answers

154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

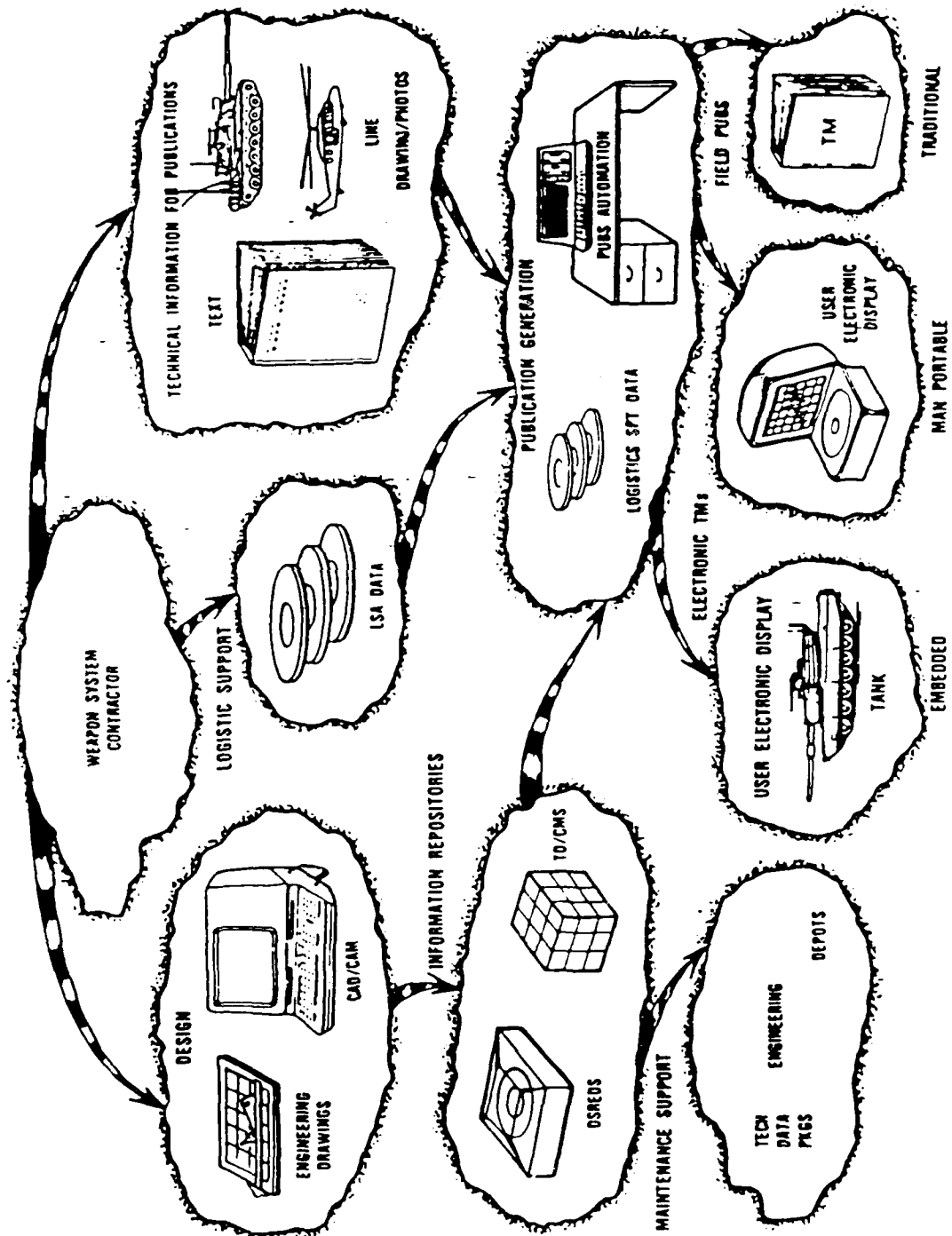
**ARMY**

**COMPUTER-AIDED ACQUISITION AND  
LOGISTIC SUPPORT  
(CALS)**

# ARMY CALS PROGRAM

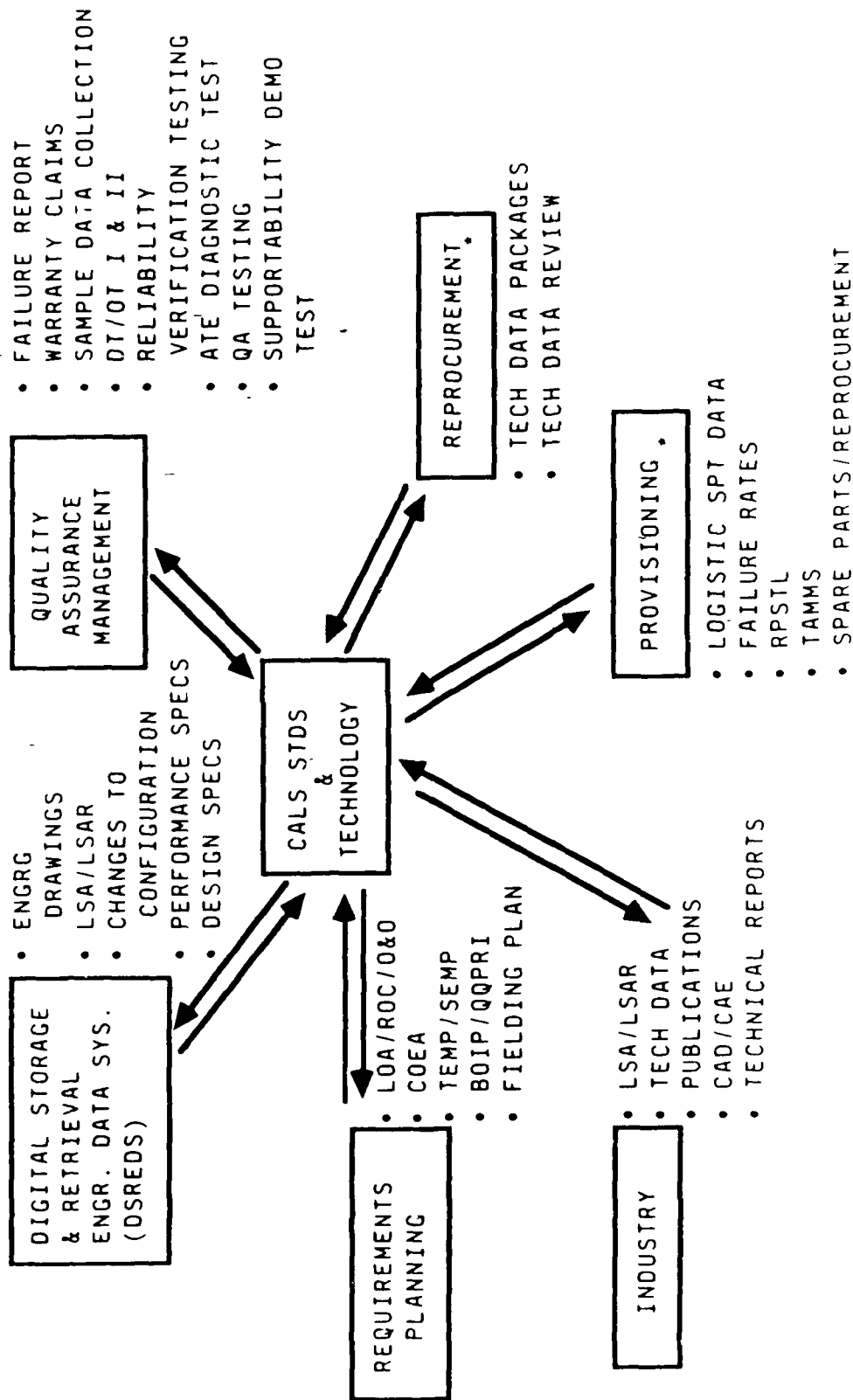
- IMPLEMENT THE DOD PROGRAM
- EVOLVE FROM CURRENT INITIATIVES
- PROVIDE CAPABILITY ARMY-WIDE
- LEAD WEAPON SYSTEM IS LHX

# ARMY CALS CONCEPTUAL LINKAGE



# COMPUTER-AIDED ACQUISITION AND LOGISTIC SUPPORT

## WHOLESALE LEVEL INFORMATION FLOW



• HAS INTERFACE WITH CCSS



## SEVEN APPLICATION AREAS FOR INITIAL IMPLEMENTATION

- LOGISTIC SUPPORT ANALYSIS/LOGISTIC SUPPORT ANALYSIS RECORD (LSA/LSAR) INCLUDING MAINTENANCE ALLOCATION CHART (MAC) & REPAIR PARTS AND SPECIAL TOOLS LIST
- PROVISIONING TECHNICAL DOCUMENTATION (TECH DATA PKGS & ENGINEERING DRAWINGS)
- DATA REQUIREMENTS DOCUMENTATION
- BASIS OF ISSUE PLAN FEEDER DATA (BOIPFD), QUALITATIVE & QUANTITATIVE PERSONNEL REQUIREMENTS INFORMATION (QQPRI), NEW EQUIPMENT TRAINING PLAN (NETP)
- TECHNICAL MANUAL SOURCE DATA (TRADITIONAL & INTERACTIVE PUBLICATIONS)
- DEPOT MAINTENANCE WORK REQUIREMENT
- DEPOT MAINTENANCE SUPPORT PLAN

# ACQUISITION OBJECTIVE

- ENCOURAGE INVESTIGATIONS OF CONCEPT ALTERNATIVES
- PROVIDE ACQUISITION FLEXIBILITY
- PROVIDE INDUSTRY INCENTIVES
- REDUCE TECHNICAL RISK
- ● EVALUTATION OF MULTIPLE CONCEPTS
- ● SUCCESSFUL DEVELOPER TO FIELD SYSTEM

22

## PHASE I

2-4 KTRS

DEL ::

# -ARCHITECTURE

**-TRANSITION  
PLAN**

-TRADE-OFF  
ANALYSIS/  
LCCE

MS-1

## PHASE II

**SOM 9**

## 2 KTRS

DEL:

# OPERATIONAL DEMO

**-PROPOSALS  
FOR DEV &  
FIELDING**

**MS II**

### PHASE III

**19 MOS**

1 KTR

DEL:

**-SYSTEM SW  
-DOCUMENTA  
TION**

## HARDWARE FOR PROTOTYPING SITES

**MS III  
PHASE IV**

1XTR

DEL:

**—HW/SW**

## —SYSTEM INTEGRATION/ INSTALLATION

## -TRAINING

**-SYSTEM MGMT**

# CALS RFP STATUS

0 COMMENTS RECEIVED

00 INDUSTRY

- 31 RESPONDENTS

- OVER 500 QUESTIONS

00 GOVERNMENT

- AMC/TRADOC/FORSCOM/ISC

- OVER 300 FORMAL COMMENTS

- HQDA AND OSD INPUT

0 ALL COMMENTS/QUESTIONS REVIEWED

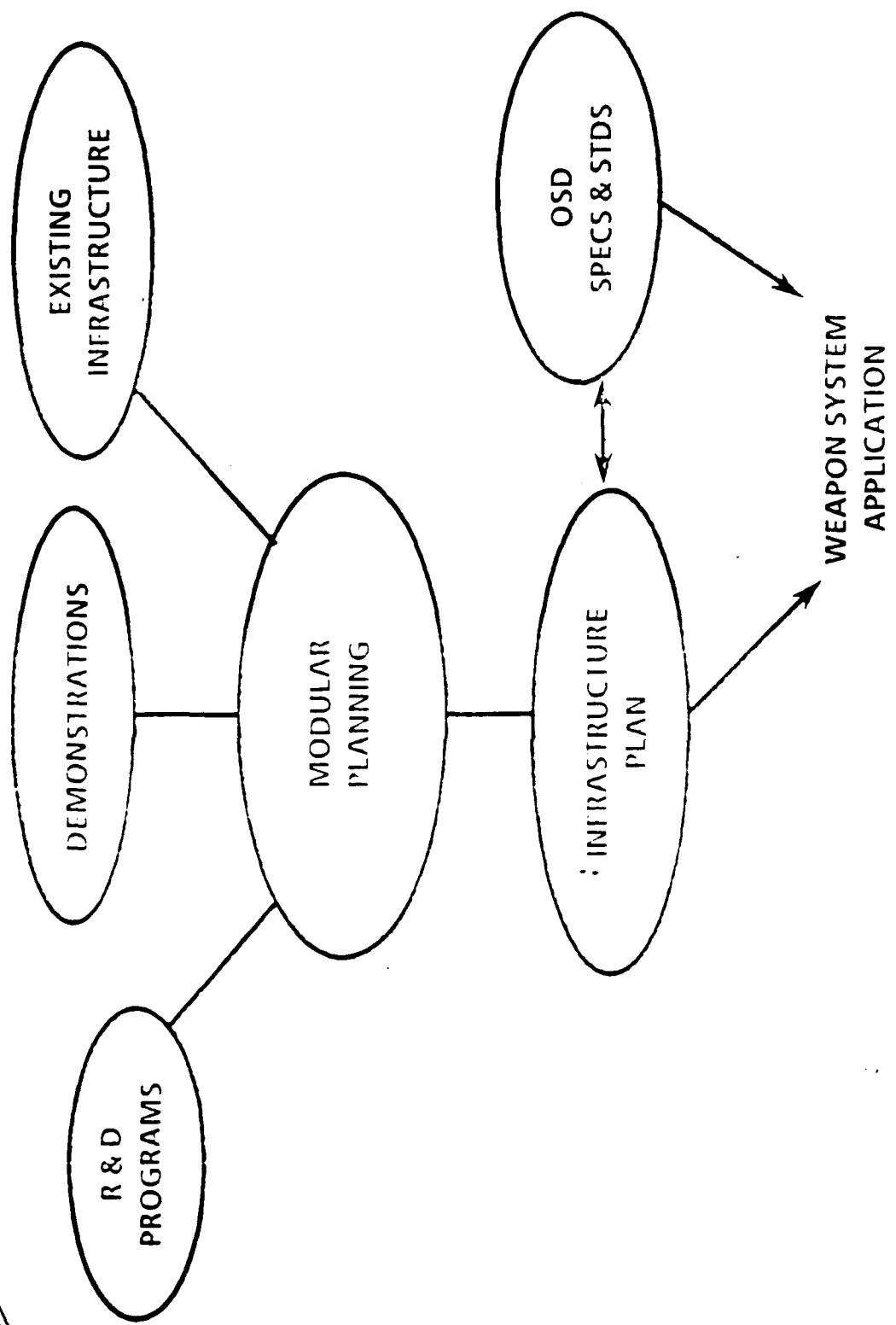
0 SOW REVISION COMPLETED BY 15 APRIL 88







# AIR FORCE STRATEGY





- 166.





## DEMONSTRATIONS

### PRECURSOR CALS (PCALS) DEMONSTRATION

- DEMONSTRATION LOGICAL CONNECTIVITY BETWEEN TWO AF PROGRAMS
- DEMONSTRATION - 1ST QUARTER FY 88
- FINAL REPORT - 3RD QUARTER FY 88

### WEAPON SYSTEM COMPOSITE DEMONSTRATION (WSCD)

- DEMONSTRATE NEAR-TERM CALS CAPABILITIES AS CAN BE APPLIED TO THE ATF
- DEMONSTRATION - 4TH QUARTER FY 88
- FINAL REPORT - 1ST QUARTER FY 89

### IMIS F-16 DEMONSTRATION

- DEMONSTRATION OF FAULT DIAGNOSTIC INFORMATION USING THE PORTABLE COMPUTER MAINTENANCE AID SYSTEM (PCMAS)
- FLIGHTLINE DEMONSTRATION - 4TH QUARTER FY 88

### VHSIC TISSS ACTIVITY

- DEFINITION OF DATA INFORMATION STANDARDS
- REQUIREMENTS FOR DATA INCLUDED IN CONCEPT DOCUMENT - 2ND QUARTER FY 88

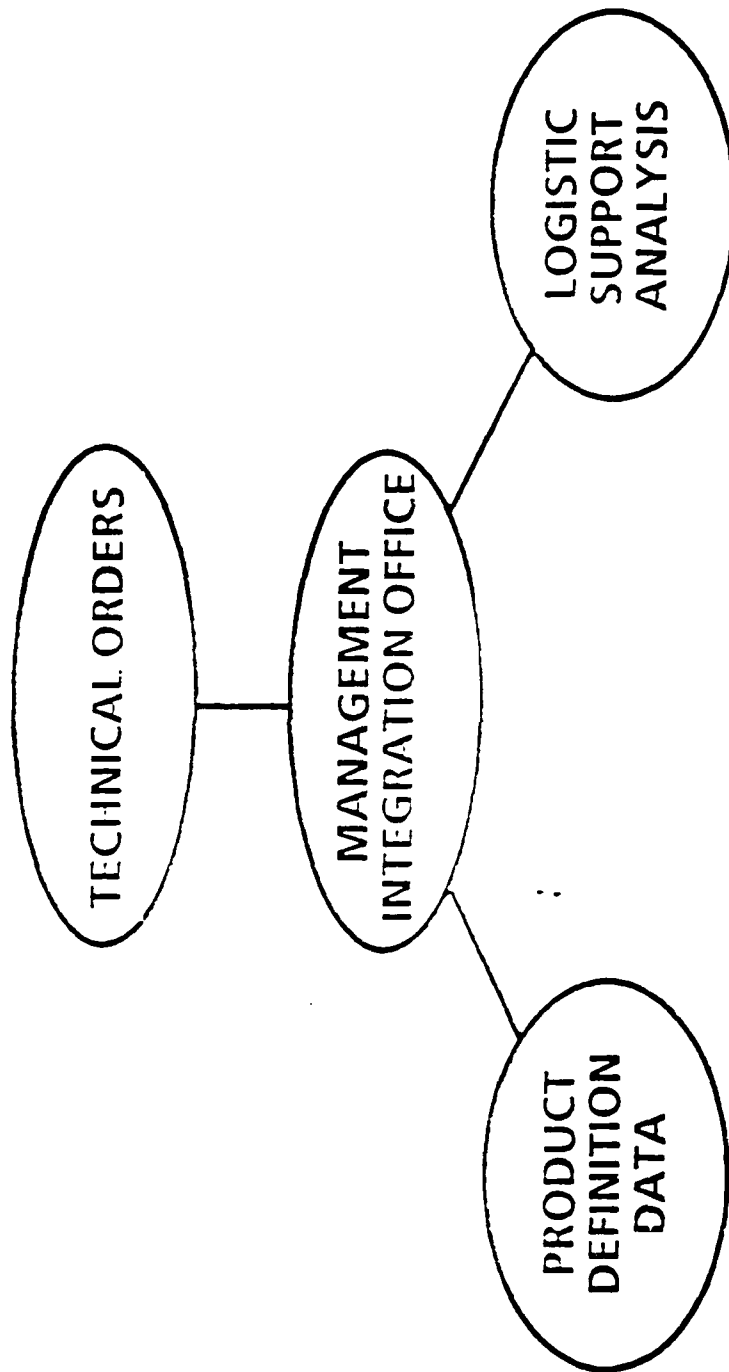


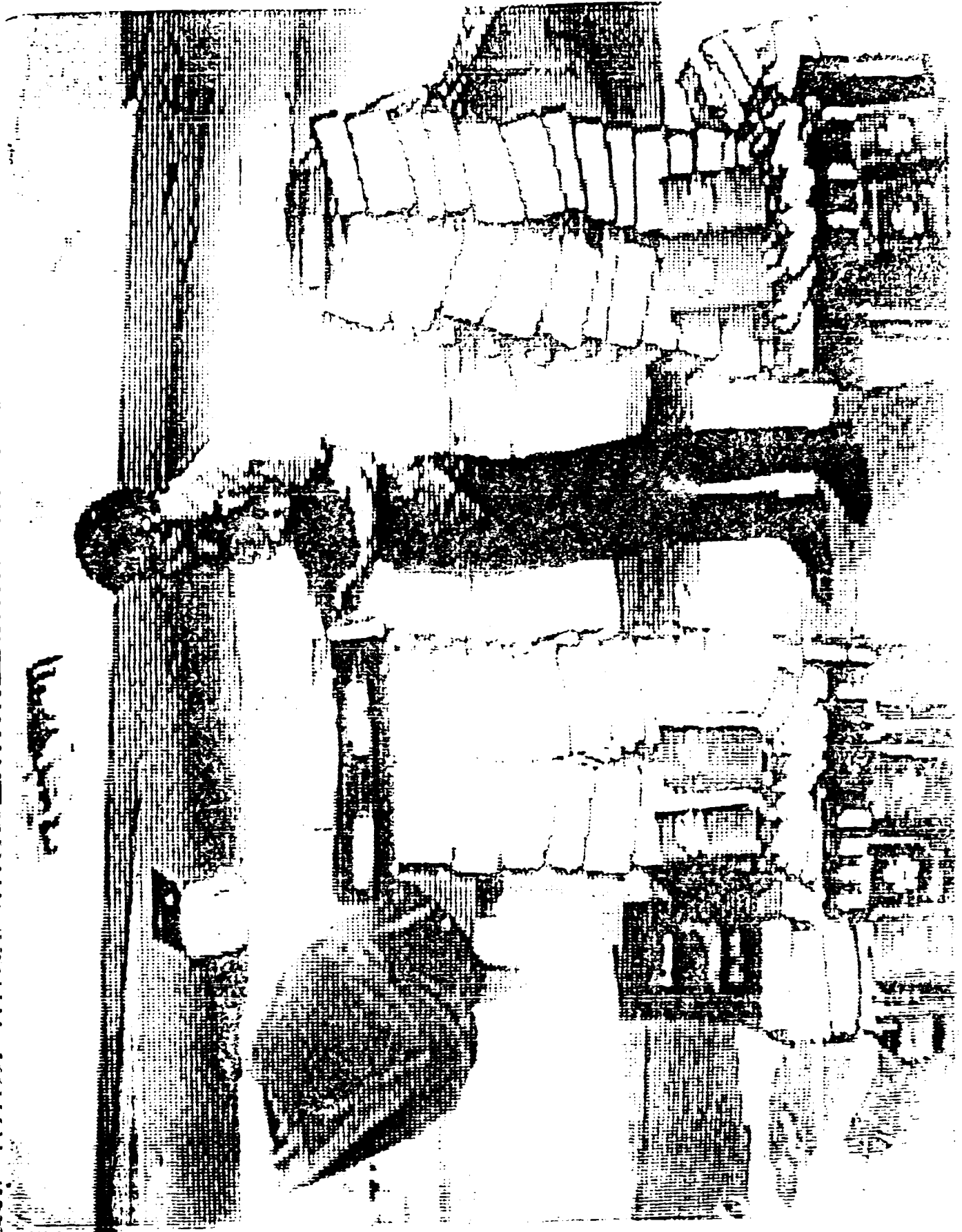
## EXISTING INFRASTRUCTURE PROGRAMS

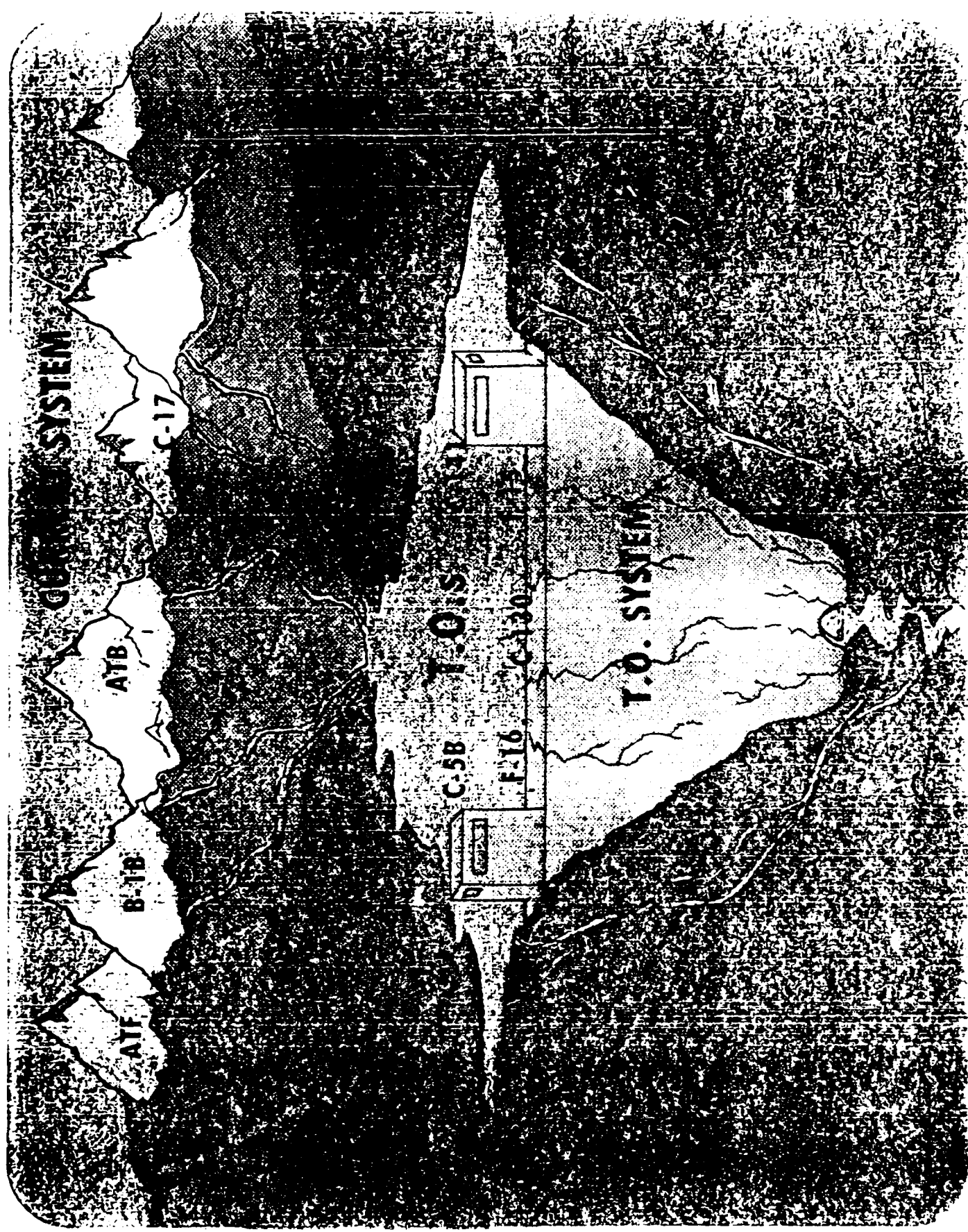
- **ENGINEERING DRAWING COMPUTER ASSISTED RETRIEVAL SYSTEM (EDCARS)**
  - AUTOMATES STORAGE AND RETRIEVAL OF ENGINEERING DRAWINGS AT 6 AFLC CENTERS.
- **UNIFIED DATA BASE (UDB)**
  - PROVIDES AUTOMATED LSAR FOR PROGRAM OFFICES
- **AUTOMATED TECHNICAL ORDER SYSTEM (ATOS)**
  - PROVIDES AUTOMATED T.O. CHANGE CAPABILITY



# MODULAR PLAN

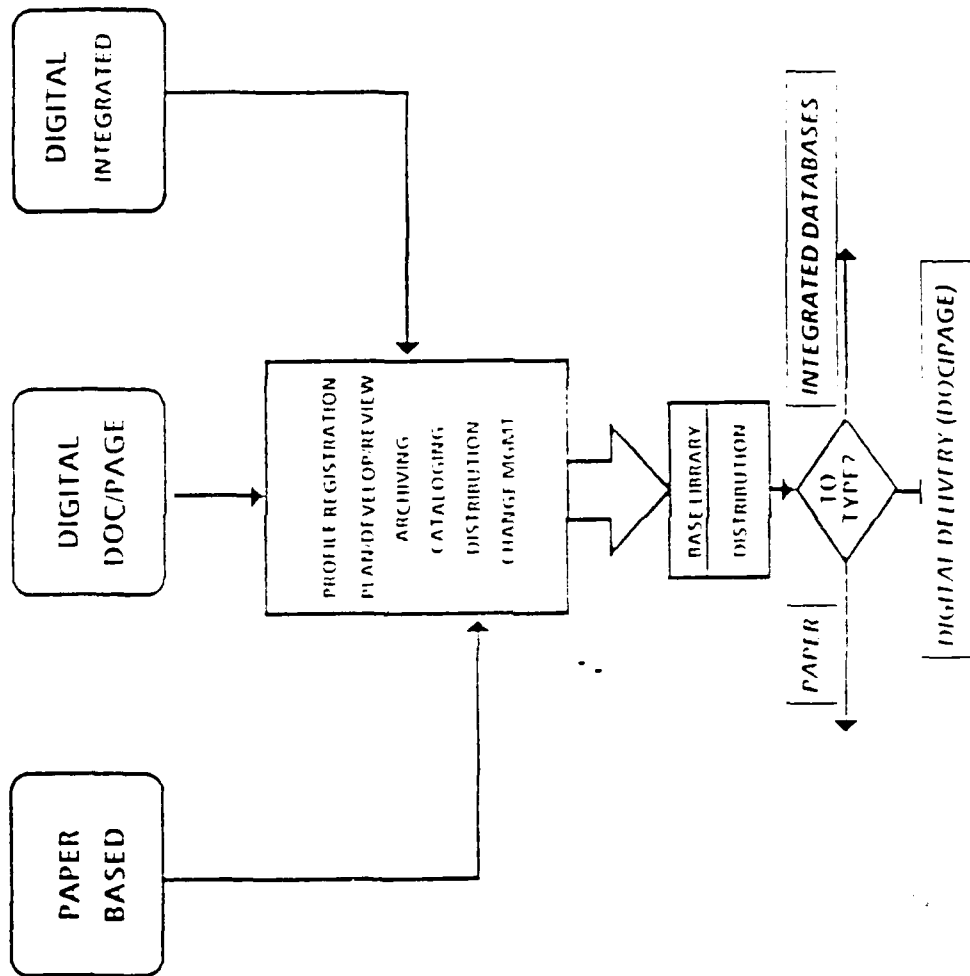








# FUNCTIONAL CONCEPT

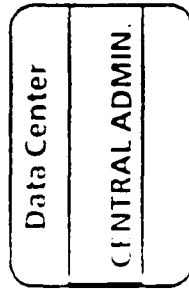




# ORGANIZATIONAL CONCEPT

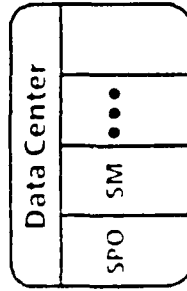
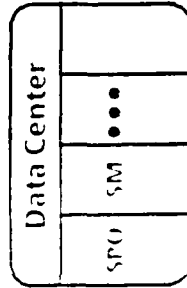
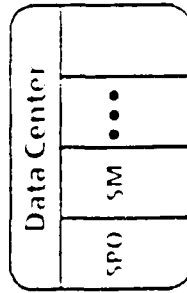
## TIER 1

CENTRAL  
ADMINISTRATION



## TIER 2

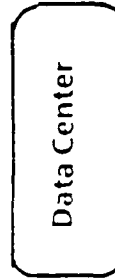
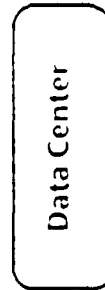
REGIONAL  
CENTER



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## TIER 3

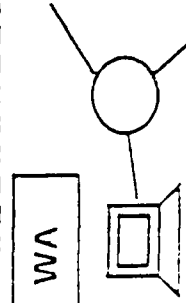
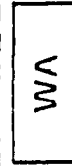
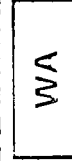
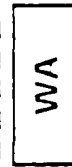
BASE  
LIBRARY



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## TIER 4

WORK  
AREA





## SUMMARY

- USAF/CV DIRECTION
- AF PLANNING FOR INFRASTRUCTURE
- AF WIDE APPLICATION
- TESTED SPECS & STDS
- INFRASTRUCTURE PROGRAMMED





176.

# DEPARTMENT OF THE NAVY CALS

---

## BACKGROUND

- REQUIREMENT FOR ACURATE, TIMELY TECHNICAL INFORMATION
- TECHNOLOGY AVAILABLE
- AUTOMATION TAKING PLACE
- CONGRESS AND DOD



# **DON CALS STRATEGIC PLANNING PROCESS**

---

- **ISSUE SECRETARY OF THE NAVY POLICY  
(SECNAVINST)**
- **FORMALIZE DON CALS ORGANIZATION  
(MOU)**
- **IMPLEMENT POLICY  
(DEVELOP STRATEGIC PLAN)**

# DEPARTMENT OF THE NAVY CALS

---

**PROJECT:** ENGINEERING DATA MANAGEMENT INFORMATION  
AND CONTROL (EDMICS)

**ACTIVITY:** NAVAL SUPPLY SYSTEMS COMMAND

**PURPOSE:** DIGITIZE, CATALOG AND STORE ENGINEERING DATA

**APPROACH:**

- CONVERT PAPER AND FILM-BASED DRAWINGS  
TO DIGITAL FORMAT
- DEVELOP ON DEMAND REPRODUCTION
- USE IGES AND DOD INTERCHANGE STANDARDS

**STATUS:**

— EDMICS CONTRACT AWARD	FY 88
— FIRST ARTICLE TEST	FY 89
— COMMENCE PRODUCTION	FY 90

# DEPARTMENT OF THE NAVY CALS

---

**PROJECT:** NAVY PRINT ON DEMAND SYSTEM (NPODS)

**ACTIVITY:** NAVY PUBLICATION AND PRINTING SERVICE

**PURPOSE:** DIGITIZED STORAGE AND DISTRIBUTION OF DOD  
MILSPECS AND STANDARDS

**APPROACH:** INTEGRATE ORDER ENTRY, STORAGE AND DEMAND  
PRINTING

**STATUS:** — OPERATIONAL WITH PARTIAL DATA BASE  
— PRODUCING 2 TO 3 MILLION PAGES PER MONTH

# DEPARTMENT OF THE NAVY CALS

---

**PROJECT:** NAVY TECHNICAL INFORMATION PRESENTATION  
SYSTEM (NTIPS)

**ACTIVITY:** NAVAL AIR SYSTEMS COMMAND

**PURPOSE:** ELECTRONICALLY GENERATE AND PRESENT TECHNICAL  
INFORMATION FOR WEAPON SYSTEM OPERATION,  
INSTALLATION AND MAINTENANCE

**APPROACH:** — CREATE CAPABILITY TO GENERATE TASK-TAILORED  
TEXT AND GRAPHICS PACKAGES  
— VALIDATE DELIVERY DEVICES

**STATUS:** — CONDUCT OPERATIONAL TESTS FY 86-87  
— DEVELOP AND DEMONSTRATE  
DISPLAY DEVICE FY 88-89



# DEPARTMENT OF THE NAVY CALS

---

**PROJECT:** AUTOMATION OF PROCUREMENT AND ACCOUNTING  
DATA ENTRY (APADE)

**ACTIVITY:** NAVAL SUPPLY SYSTEMS COMMAND

**PURPOSE:** IMPROVE RESPONSIVENESS OF SUPPLY SYSTEM

**APPROACH:** DEVELOP A STANDARDIZED PROCUREMENT DATA  
PROCESSING SYSTEM

**STATUS:** DEPLOYED AT ALL EIGHT NAVAL SUPPLY CENTERS,  
ONE NAVAL REGIONAL CONTRACTING CENTER AND  
ONE NAVAL SHIPYARD

# DEPARTMENT OF THE NAVY CALS

---

**PROJECT:** COMPUTER-AIDED DESIGN/SECOND ACQUISITION  
(CAD-2)

**ACTIVITY:** NAVAL DATA AUTOMATION COMMAND

**PURPOSE:** USE CAD TECHNOLOGY TO IMPROVE PRODUCTIVITY

**APPROACH:**

- BUY COMMERCIALY AVAILABLE CAD TECHNOLOGY
- REQUIRE VENDORS TO MEET DOD AND NBS DATA TRANSFER STANDARDS
- USER COMMANDS BUY EQUIPMENT THROUGH MASTER CONTRACTS

**STATUS:** RFP UNDER DEVELOPMENT

# DEPARTMENT OF THE NAVY CALS

**PROJECT:** SSN-21 SUBMARINE CALS DEMONSTRATION

**ACTIVITY:** NAVSEA, NEWPORT NEWS SHIPBUILDING, AND  
GENERAL DYNAMICS (ELECTRIC BOAT DIVISION)

**PURPOSE:** — DIGITIZE AND TRANSFER ENGINEERING AND  
TECHNICAL DATA BETWEEN DISSIMILAR CAD  
SYSTEMS

— FACILITATE ACCESS TO CURRENT LOGISTICS  
TECHNICAL INFORMATION

**APPROACH:** — USE SSN-21 AS PLATFORM FOR DEVELOPING AND  
TESTING CALS CONCEPT (e.g. ARCHITECTURE AND  
STANDARDS FOR CALS TYPE EFFORT)

— USE IGES TO TRANSFER DATA

**STATUS:**

— REQUIREMENTS

— SYSTEM DESIGN

— ON-LINE COMMUNICATIONS LINK

— PROCEDURES, STANDARDS AND SOFTWARE 3RD QTR FY88

— IGES/PDES INPUT

COMPLETE

3/88

6/88

ONGOING

# DEPARTMENT OF THE NAVY CALS

**PROJECT:** V-22 AIRCRAFT CALS DEMONSTRATION

**ACTIVITY:** NAVAIR, BELL, BOEING, AND ALLISON

**PURPOSE:** DEVELOP SYSTEM TO USE OPERATIONAL FEEDBACK DATA TO SUBSTANTIATE DECISIONS MADE DURING DESIGN PROCESS

**APPROACH:**

- DEFINE FUNCTIONS THAT REQUIRE OPERATIONAL FEEDBACK DATA
- DESIGN SYSTEM TO COLLECT, SYNTHESIZE AND ANALYZE THIS DATA FOR BOTH DESIGN AND IN-SERVICE ENGINEERING

**STATUS:**

- FUNCTIONAL REQUIREMENTS ANALYSIS FY 88
- SYSTEM DESIGN FY 89
- PROTOTYPE DEMONSTRATION FY 90
- FINAL SYSTEM SPECIFICATION FY 90

# DEPARTMENT OF THE NAVY CALS

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## DEMONSTRATION PROJECTS

<b>PROJECT:</b>	<b>MINE COUNTERMEASURES (MCM) PRODUCT MODEL PROTOTYPE</b>
<b>ACTIVITY:</b>	<b>NAVAL SEA SYSTEMS COMMAND</b>
<b>PURPOSE:</b>	<b>DEVELOP AND TEST FEASIBILITY OF SHIP SYSTEM INTEGRATED DATA BASE FOR MANAGING CONFIGURATION, MAINTENANCE PLANNING AND TRAINING</b>
<b>APPROACH:</b>	<b>COMBINE ENGINEERING DESIGN, CONSTRUCTION AND LOGISTIC TEXT WITH 3-D GRAPHICS</b>
<b>STATUS:</b>	<b>DEMONSTRATE 3-D GRAPH MODEL OF MCM MACHINERY ROOM – COMPLETE</b>



# DEPARTMENT OF THE NAVY CALS

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**SUPPORTING  
INITIATIVE:**

NAVY/INDUSTRY DIGITAL DATA EXCHANGE  
STANDARDS COMMITTEE (NIDDESC)

**ACTIVITY:**

NAVSEA, NATIONAL SHIPBUILDING RESEARCH  
PROGRAM

**PURPOSE:**

DEFINE HOW NAVY AND MARINE INDUSTRY WILL  
DEVELOP, STORE, EXCHANGE AND USE DIGITAL DATA  
FOR SHIP DESIGN, CONSTRUCTION, OPERATIONS AND  
MAINTENANCE

**APPROACH:**

IDENTIFY TASKS THAT WILL ALLOW MARINE INDUSTRY  
TO IMPLEMENT DIGITAL DATA TRANSFER

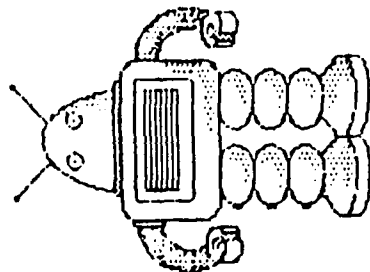
**STATUS:**

ONGOING





# COMPUTER-AIDED ACQUISITION & LOGISTICS SUPPORT (CALS)



LOOK TO THE FUTURE!

## A DLA CALS OVERVIEW

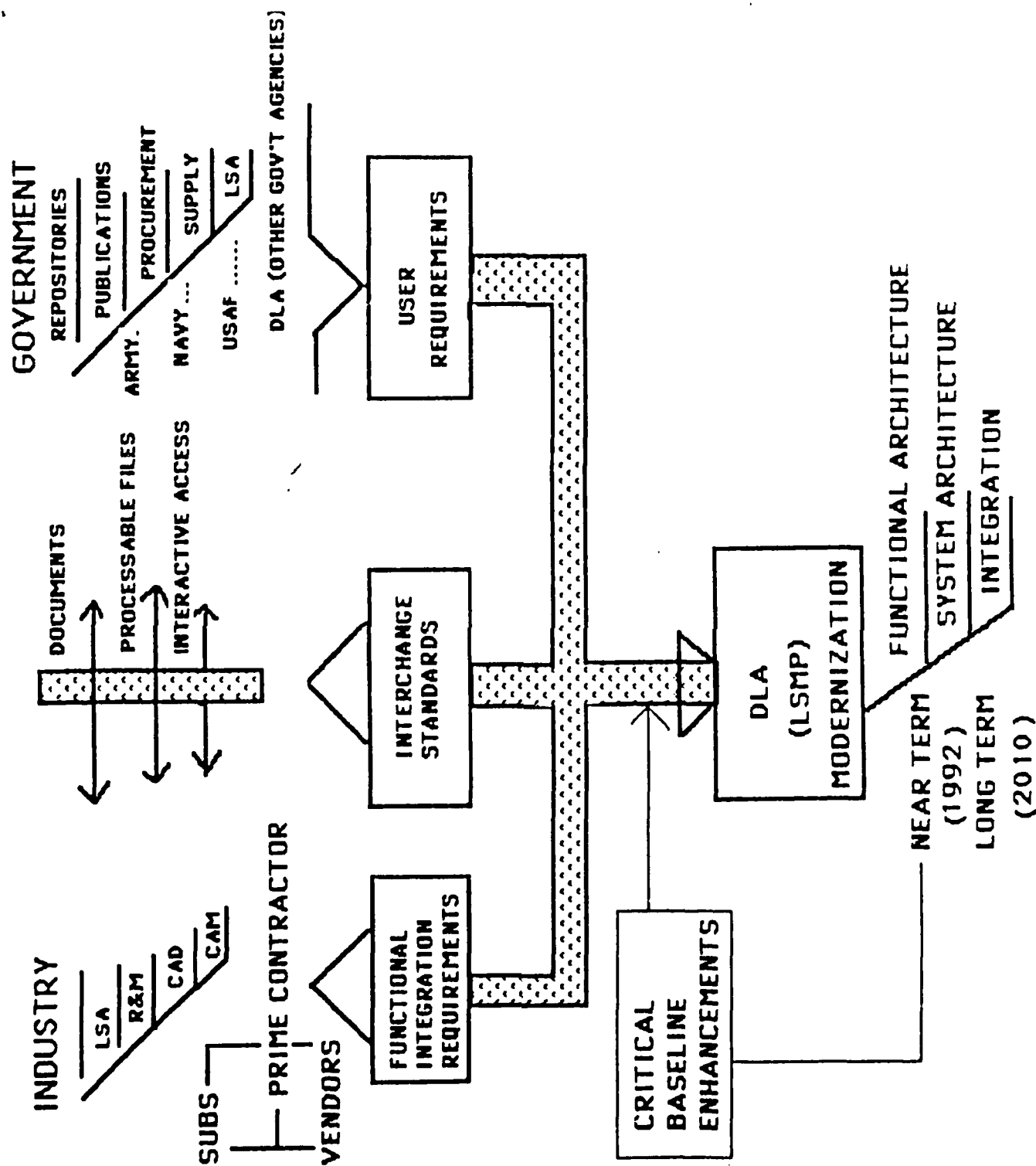
BRIEFER:

KAREN

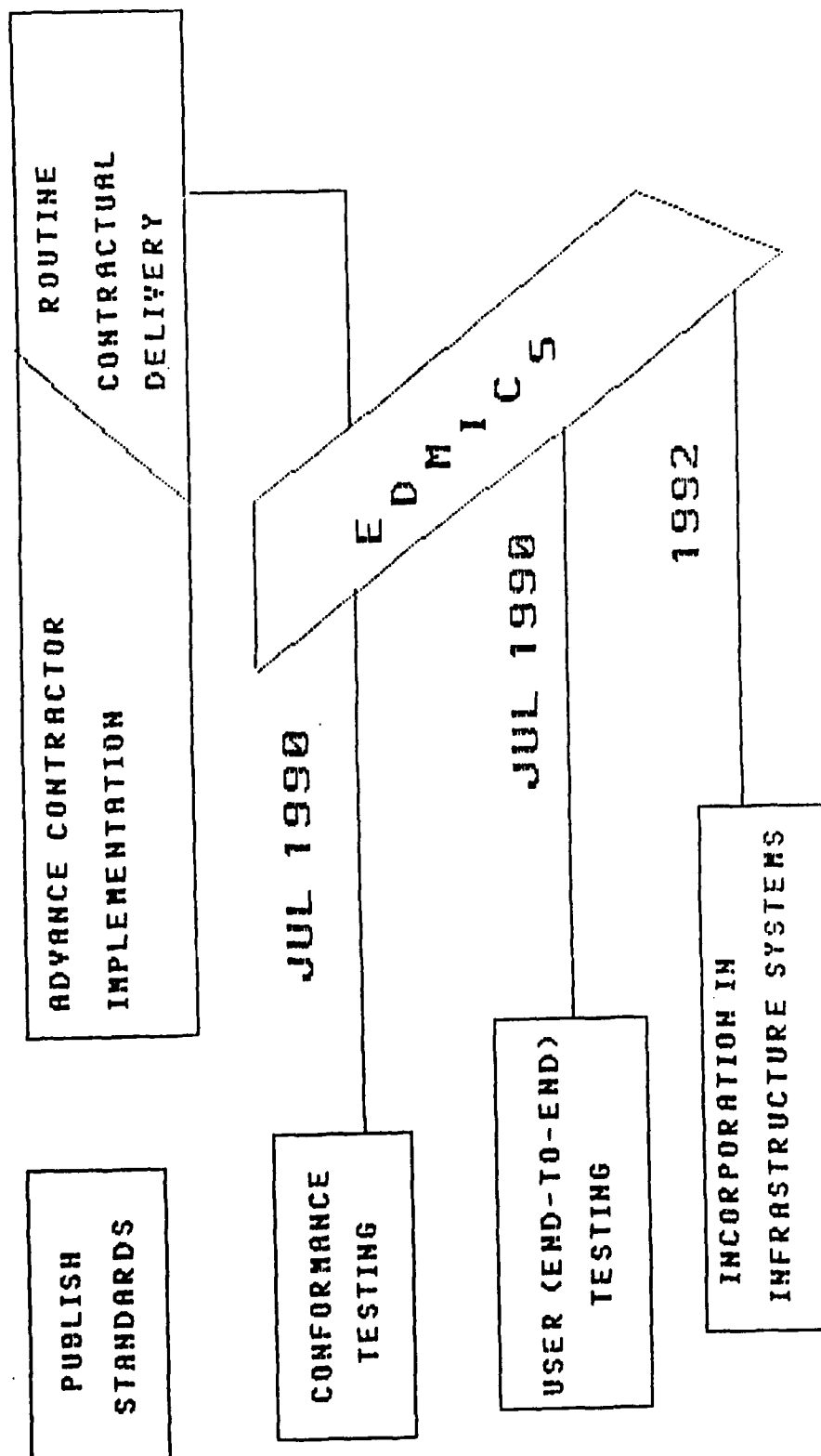
GREGORY

DLA-Z  
(DCLSO)

# DIGITAL INFORMATION EXCHANGE

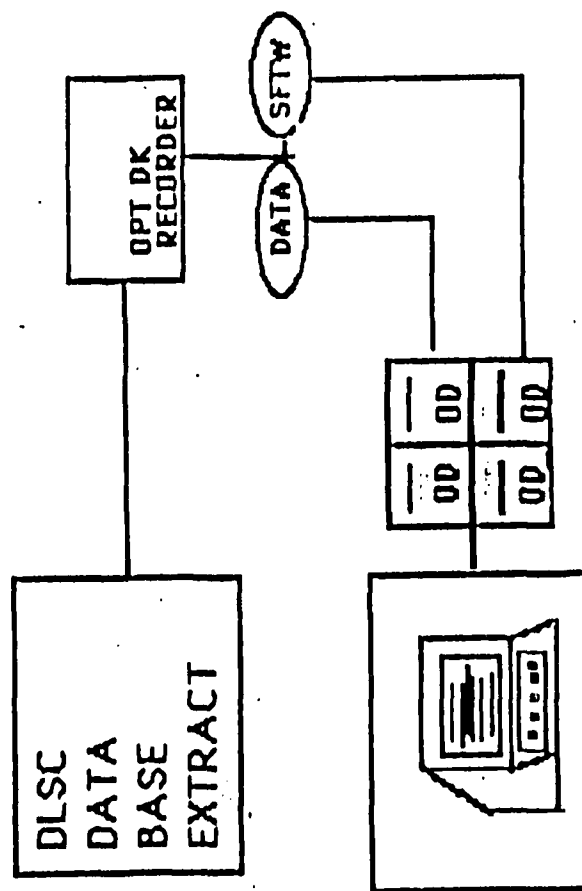


# DLA EDMICS IMPLEMENTATION / TESTING



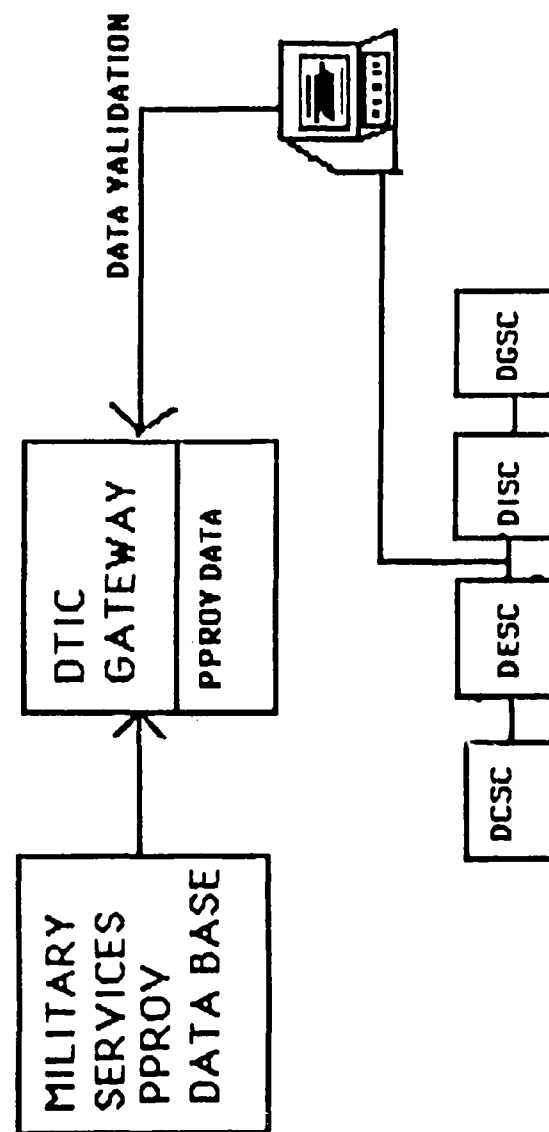
## APPLICATION

- FED LOG: OPTICAL DISK DATA
- INITIATIVE: OPTICAL MEDIA DISTRIBUTION
- DATA SOURCE: DLSC TIR DATA
- FUNCTION: PUBLICATIONS/SEARCH
- SCOPE: DoD & INDUSTRY CUSTOMERS
- SCHEDULE: APRIL 88 PRODUCTION TEST

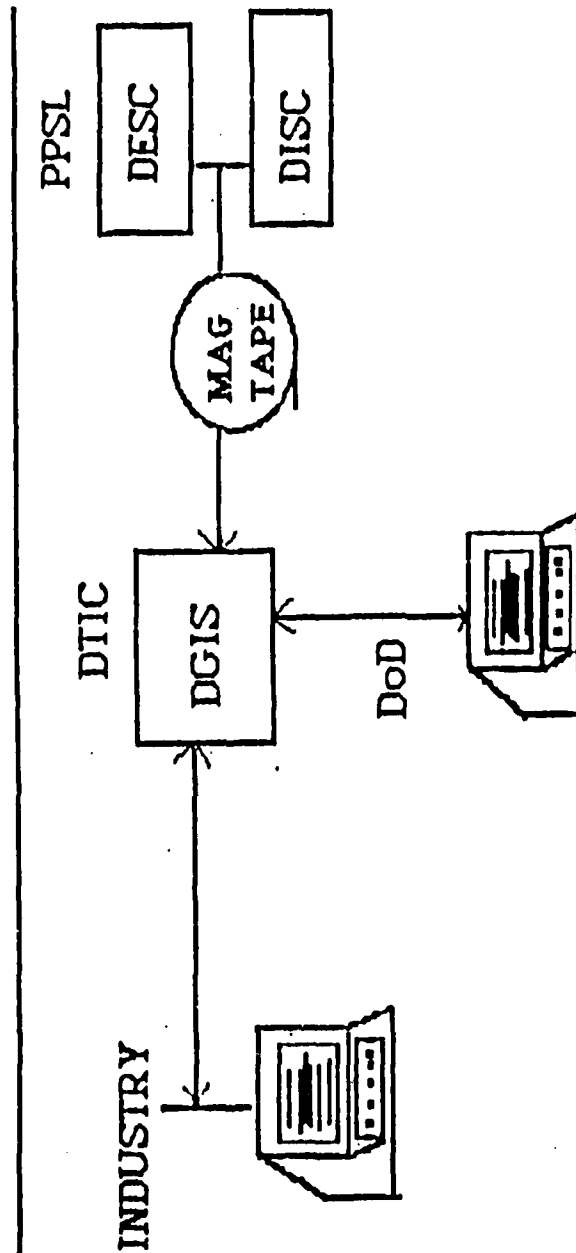


## APPLICATION

- PPROV: PREPROVISIONING
- INITIATIVE: AUTOMATE VALIDATION PROCESS
- TRANSITION: PAPERLESS
- FUNCTION: DATA VALIDATION
- SCOPE: AIR FORCE, ARMY, NAVY
- SCHEDULE: MAR 88

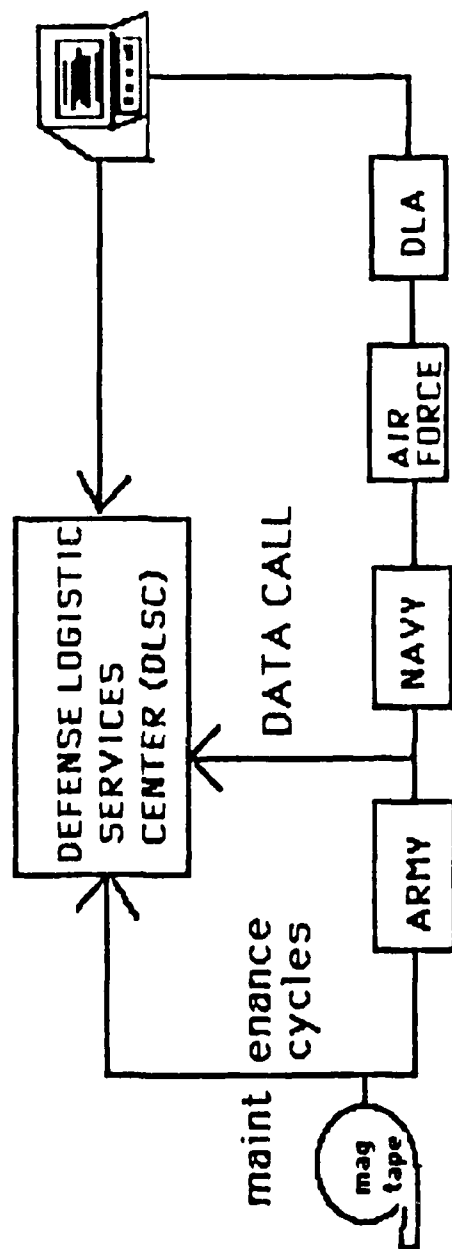


APPLICATION: GOVERNMENT FURNISHED BASELINE (GFB)  
 INITIATIVE: INDUSTRY ACCESS TO GFB  
 TRANSITION: PAPERLESS & INTERACTIVE  
 FUNCTION: STANDARDIZATION  
 SCOPE: DLA & INDUSTRY  
 SCHEDULE: INITIAL DEMO JAN 88  
 PROTOTYPE DEMO MAR88



## APPLICATION

- MEDALS: MILITARY ENGINEERING DATA ASSET  
LOCATOR SYSTEM
- TRANSITION: PAPERLESS
- INITIATIVE: AUTOMATE DoD LOCATOR SYSTEM
- FUNCTION: DoD TECH DATA
- SCOPE: DoD TECH DATA REPOSITORIES
- SCHEDULE: IMPLEMENTATION SEPT 88









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